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TVAAGCPDQSPELQPWNPGHDQDHVHIGQGKTLLLTSSATVYIHISEGGKLVIKDHD
EPIVLRTRHILIDNGGELHAGSALCPFGNFTIILYGRADEGIQPDIFYGLKYIVVGKG
GALEHGQKKLSWTFLNKTLPGGMAEGGYFFERSWGHRGVIVHVIDPKSGTVIHSDRF
DTYRSKKESERLVQYLNAVPDGRILSVAVNDEGSRNLDMDMARKAMTKLGSKHFLHLGFR
HPWSFLTVGNPSSVEDHIEYHGRGSAAARVFKLFQTEHGEYFNVSLSSEWQDVEW
TEWFHDHKVSQTKGGEKISDLWKAHPGKICNRPIDIQATTMDGVNLSTEVVYKKGQDYR
FACYDRGRACRSYRVRFCLCGPKVRPKLTVTIDTNVNSTILNLEDNVQSWKPGDTLVIAS
TDYSMYQAEEFQVLPKRSCAPNQVKVAGKPMYLHIGEEIDGVDMRAEVGLLSRNIIVMG
EMEDKCYPYRNHICNFFDFDTFGGHIKFALGFKAAHLEGTELKHMGQQLVGQYPIHFHL
AGDVDERGGYDPPTYIRDLSIHHTFSRCVTVHGSNGLIKDVVGYNLGHCFTEGDPE
ERNTFDHCLGLLVKS GTLLPSDRDSKMCKMITE DSYPGYIPKPRQDCNAVSTFWMANPN
NNLINCAAAGSEETGFWFIFHHVPTGPSVGMYSPGYSEHIPLGKFYNNRAHSNYRAGMI
IDNGVKTTEASAKDKRPFLSIISARYSPHQDADPLKPREPAIIRHFIAYKNQDHGAWLR
GGDVWLDSRFADNGIGLTLASGGTFPYDDGSKQEIKNSLFVGESGNVGETEMMDNRIWG
PGGLDHSGRTLPIGQNFPIRGIQLYDGPINIQNCTFRKFVALEGRHTSALAFRLNNAWQ
SCPHNNVTGIAFEDVPITSRVFFGEPGPWFNQLMDGDKTSVFDVDGSVSEYPGSYLT
KNDNWLVHPDCINVPDWRGAICSGCYAQMYIQAYKTSNLRMKIIKNDFPSHPLYLEGA
LTRSTHYQQYQPVVTLQKGYTIHWDQTAPAEALAIWLINFNKGDWIRVGLCYPRGTTFSI
LSDVHNRLLKQTSKTGVFVRTLQMDKVEQSYPGRSHYYWDEDGSLFLKLKAQNEREKF
AFCSMKGCERIKIKALIPKNAGVSDCTATAYPKFTERAVDVPMPPKQLFGSQLKTKDHF
LEVMESSKQHFFHLWNDFAYIEVDGKKYPSS EDGIQVVIDGNQGRVVSHTSFRNSIL
QGIPWQLFNYVATIPDNSIVLMASKGRYVSRGPWTRVLEKLGADRGLKLKEQMAFVGFK
GSFRPIWVTLTDEDHKAKIFQVVPPIPVVKKKL

Fig. 1A
Amino acid sequence of secreted ColoUp1 protein (I)
(SEQ ID NO: 1)

AGCPDQSPLEQPWNPGHDQDHVHIGQGKTLLLTSSATVYSIHISEGGKLVIKDHDPEI
VLRTRHILIDNGGELHAGSALCPFQGNFTIILYGRADEGIQPDIFYGLKYIVGVKGAL
ELHGQKKLSWTFLNKTLPGGMAEGGYFFERSWGRGVIVHVIDPKSGTVIHSDFDTY
RSKESERLVQYLNAVPDGRILSVAVNDEGSRNLDLDMARKAMTKLGSKHFLHLGFRHPW
SFLTVKGNPSSVEDHIEYHGRGSAARVFKLFQTEHGEYFNVSLSEWQDVEWTEW
FDHDKVSQLKGEEKISDLWKAHPGKICNRPIDIQATTMDGVNLSTEVVYKKGQDYRFAC
YDRGRACRSYRVRFLCGKPVRPKLTVIDTNVNSTILNLEDNVQSWKPGDTLVIASTDY
SMYQAEEFQVLPCRSCAPNQVKVAGKPMYLHIGEEIDGVDMRAEVGLLSRNIIVMGEME
DKCYPYRNHICNFFDFDTFGGHIKFALGFKAAHLEGTELKHMGQQLVGQYPIHFHLAGD
VDERGGYDPPTYIRDLSIHHTFSRCVTVHGSNGLIKDVVGYNLGHCFTEGPEERN
TFDHCLGLLVKGTLPSRDSKMCKMITEDSYPGYIPKPRQDCNAVSTFWMANPNNNL
INCAAAGSEETGFWFIFHHVPTGPSVGMYSPGYSEHIPLGKFYNRAHSNYRAGMIIDN
GVKTTEASAKDKRPFLSIISARYSPHQDADPLKPREPAIIRHFIAYKNQDHGAWLRGGD
VWLDSCRFADNGIGLTLASGGTFPYDDGSKQEIKNSLFVGESGNVGTEMDNRIWGPGG
LDHSGRTLPIGQNFPIRGIQLYDGPINIQNCTFRKFVALEGRHTSALAFLRNNAWQSCP
HNNVTGIAFEDVPITSRVFFGEPGPWFNQLMDGDKTSVHDVDGSVSEYPGSYLTKND
NWLRHPDCINVPDWRAICSGCYAQMYIQAYKTSNLRMKIIKNDFPSHPLYLEGALTR
STHYQQYQPVVTLQKGYTIHWDTAPAEALAIWLINFNKGDWIRGLCYPRGTTFSILSD
VHNRLLKQTSKTGVFVRTLQMDKVEQSYPGRSHYYWDEDGGLFLKLKAQNEREKFAFC
SMKGcerIKIKALIPKNAGVSDCTATAYPKFTERAVVDVPMPKLFSQLKTKDHFLEV
KMESSKQHFPHLWNDFAYIEVDGKKYPSSEDGIQVVVIDGNQGRVVSHTSFRNSILQGI
PWQLFNYVATIPDNSIVLMA SKGRYVSRGPWTRVLEKLGADRGLKLKEQMAFVGFKGSF
RPIWVTLTDTEDHKAKIFQVVPIPVVKKKKL

Fig. 1B
Amino acid sequence of secreted ColoUp1 protein (II)
(SEQ ID NO: 2)

LQEVHVSKE^TIGKISAASKMMWCSAAVDIMFLLDGSNSVGKGSFERSKHFAITVCDGLD
ISPERVRVGAFQSSTPHLEFPLDSFSTQQEVKARIKRMVFKGGRTETELALKYLLHRG
LPGGRNASVPQI^LIIVTDGKSQGDVALPSKQLK^REVTVFAVGVRFPRWEELHALASEP
RGQHVLLAEQVEDATNGLFSTLSSAICSSATPDCRVEAHPC^EHRTLEMVREFAGNAPC
WRGSRRTLAVLAACPFYSWKRVFLTHPATCYRTT^CPGPCDSQPCQNGGT^CVPEGLDGY
QCLCPLAFGGEANCALKSLECRV DLLFLLDSSAGTTLDGFLRAKFV^KR^FVRAVLSED
SRARVG^VATYSRELLVAVPVGEYQDV^DPD^LVWSLDGIPFRGGPTLTGSALRQAAERGF^GS
ATRTGQDRPRVVVLLTESHSEDEVAGPARHARARE^{LLL}LGVGSEAVRAELEEITGSPK
HVMVYSDPQDLFNQIPELQGKLC^RPGC^RTQALDLVFM^LDT^SASVG^PENFAQM^QS^FV
RSCALQFEVNPDVTQVGLVVYGSQVQTAFL^GLD^TKP^TRAAMLR^AISQAPYLGGVG^SAGTA
LLHIYDKVMTVQRGARP^GVPKAVVVL^TGG^RGAEDAAVPAQKLRNNNGISVLVVGVGPVLS
EGLRRLAGPRDSL^IHVAAYADLRYHQDVLIEWL^CGEAKQP^VNLCKP^SPCMNEGSCVLQN
GSYRCKCRDGWEGPHCENRFLRRP

Fig. 2
Amino acid sequence of secreted ColoUp2 protein
(SEQ ID NO: 3)

CGTGACACTGTCTCGGCTACAGACCCAGAGGGAGCACACTGCCAGGATGGGAGCTGCTG
 GGAGGCAGGACTTCCTCTTCAAGGCCATGCTGACCATCAGCTGGCTCACTCTGACCTGC
 TTCCCTGGGCCACATCCACAGTGGCTGCTGGGTGCCCTGACCAGAGCCCTGAGTTGCA
 ACCCTGGAACCCTGGCCATGACCAAGACCACCATGTGCATATCGGCCAGGGCAAGACAC
 TGCTGCTCACCTCTGCCACGGTCTATTCCATCCACATCTCAGAGGGAGGCAAGCTG
 GTCATTAAAGACCACCGACGAGCCGATTGTTTGCAGACCCGGCACATCCTGATTGACAA
 CGGAGGAGAGCTGCATGCTGGAGTGCCTCTGCCCTTCCAGGGCAATTTCACCATCA
 TTTGTATGGAAGGGCTGATGAAGGTATTGCCAGGGATCCTTACTATGGTCTGAAGTAC
 ATTGGGTTGGTAAAGGAGGCCCTTGAGTTGCATGGACAGAAAAAGCTCTCCTGGAC
 ATTTCTGAACAAGACCCCTCACCCAGGTGGCATGGCAGAAGGAGGCTATTGGGAAA
 GGAGCTGGGCCACCGTGGAGTTATTGTCATGTCATGCCACCCAAATCAGGCACAGTC
 ATCCATTCTGACCGTTGACACCTATAGATCCAAGAAAGAGAGTGAACGTCTGGTCCA
 GTATTGAAACGCGGTGCCGATGGCAGGATCCTTCTGTTGCAGTGAATGATGAAGGTT
 CTCGAAATCTGGATGACATGCCAGGAAGGCATGCCAAATTGGGAAGCAAACACTTC
 CTGCACCTTGGATTAGACACCCCTGGAGTTCTAACTGTGAAAGGAAATCCATCATC
 TTCAGTGGAAAGACCATATTGAATATCATGGACATCGAGGCTCTGCTGCTGCCGGTAT
 TCAAATTGTCAGACAGAGCATGGCGAATATTCAATGTTCTTGTCCAGTGAGTGG
 GTTCAAGACGTGGAGTGGACGGAGTGGTTCGATCATGATAAAGTATCTCAGACTAAAGG
 TGGGAGAAAATTCTAGACCTCTGGAAAGCTCACCCAGGAAAATATGCAATCGTCCC
 TTGATATAACAGGCCACTACAATGGATGGAGTTAACCTCAGCACCGAGGTTGTCTACAAA
 AAAGGCCAGGATTATAGGTTGCTGCTACGACCGGGGAGGCCTGCCGAGCTACCG
 TGTACGGTTCTCTGTGGGAAGCCTGTGAGGCCAAACTCACAGTCACCATTGACACCA
 ATGTGAACAGCACCATTCTGAACTTGGAGGATAATGTACAGTCATGGAAACCTGGAGAT
 ACCCTGGTCATTGCCAGTACTGATTACTCCATGTACCGAGGAGGTTCCAGGTGCT
 TCCCTGCAGATCCTGCGCCCCAACCAGGTCAAAGTGGCAGGGAAACCAATGTACCTGC
 ACATCGGGGAGGGAGATAGACGGCGTGGACATGCCGGAGGTGGCTCTGAGCCGG
 AACATCATAGTGTGGGGAGATGGAGGACAAATGCTACCCCTACAGAAACCACATCTG
 CAATTCTTGACTTCGATACCTTGGGGCACATCAAGTTGCTCTGGGATTAAAGG
 CAGCACACTTGGAGGGCACGGAGCTGAAGCATATGGGACAGCAGCTGGTGGTCAGTAC
 CCGATTCACTTCCACCTGGCCGGTGATGTAGACGAAAGGGAGGTTATGACCCACCC
 ATACATCAGGGACCTCTCCATCCATCATACATTCTCGCTGCGTCACAGTCCATGGCT
 CCAATGGCTGTTGATCAAGGACGTTGGCTATAACTCTTGGGCCACTGCTTCTTC
 ACGGAAGATGGGCCGGAGGAACGCAACACTTTGACCACTGTCTGGCCTCTGTCAA
 GTCTGGAAACCTCCTCCCTGGACCGTGACAGCAAGATGTGCAAGATGATCACAGAGG
 ACTCCTACCCAGGGTACATCCCCAAGCCCAGGAAGACTGCAATGCTGTGTCACCTTC
 TGGATGGCCAATCCAACACAACCTCATCAACTGTGCCGTGAGGATCTGAGGAAAC
 TGGATTGGTTATTTCACCACTGGAAAATTCTATAACAACCGAGCACATTCAAC
 TACCGGGCTGGCATGATCATAGACAACGGACTAAAACCACCGAGGCCCTGCCAAGGA
 CAAGCGGCCGTTCTCTCAATCATCTGCCAGATAACGCCCTCACCAGGACGCCGACC
 CGCTGAAGCCCCGGAGGCCGGCATCATCAGACACTTCATTGCCCTACAAGAACCAAGG
 CACGGGGCCTGGCTGCCGGGGATGTGTGGCTGGACAGCTGCCGGTTGCTGACAA
 TGGCATTGGCCTGACCCCTGGCCAGTGGTGGAACCTTCCGTATGACGACGGCTCCAAGC
 AAGAGATAAAGAACAGCTTGTGTTGGCGAGAGTGGCAACGTGGGACGGAAATGATG
 GACAATAGGATCTGGGCCCTGGCGGCTTGGACCATAGCGGAAGGACCCCTCCCTATAGG

Fig. 3
 Nucleic acid sequence of ColoUp1
 (SEQ ID NO: 4)

CCAGAATTTCATTAGAGGAATTCACTTATGATGGCCCCATCAACATCCAAA
GCACCTTCCGAAAGTTGTGGCCCTGGAGGGCCGGCACACCAGCGCCCTGGCCTTCCGC
CTGAATAATGCCTGGCAGAGCTGCCCATAACAAACGTGACC GG CATTGCCTTGAGGA
CGTCCGATTACTTCCAGAGTGTCTCGGAGAGCCTGGGCCCTGGTTCAACCAGCTGG
ACATGGATGGGATAAGACATCTGTGTTCCATGACGTCGACGGCTCCGTGTCGAGTAC
CCTGGCTCCTACCTACGAAGAATGACAACACTGGCTGGCCGGCACCCAGACTGCATCAA
TGTTCCCGACTGGAGAGGGGCCATTGCAGTGGTGCTATGCACAGATGTACATTCAAG
CCTACAAAGACCACTGCAATGAAGATCATCAAGAATGACTTCCCCAGCCACCC
CTTACCTGGAGGGCGCTACCAAGGAGCACCCATTACAGCAATACCAACCGGTTGT
CACCCCTGCAGAAGGGCTACACCCTCACTGGGACCAAGACGGCCCCCGCCAACTGCCA
TCTGGCTCATCAACTCAACAAGGGCACTGGATCCGAGTGGGCTCTGCTACCCCGA
GGCACACATTCTCCATCCTCTGGATGTTACAATGCCCTGCTGAAGCAAACGTCCAA
GACGGCGTCTCGTGAGGACCTTGCAAGATGGACAAAGTGGAGCAGAGCTACCGCA
GGAGCCACTACTACTGGGACGAGGACTCAGGGCTGTTCTGAAGCTGAAAGCTCAG
AACGAGAGAGAGAAGTTGCTTCTGCTCCATGAAAGGCTGTGAGAGGATAAAGATTAA
AGCTCTGATTCAAAGAACGCAAGCGTCACTGCACAGCCACAGCTTACCCCAAGT
TCACCGAGAGGGCTGTCGTAGACGTGCCGATGCCAAGAAGCTTTGGTTCTCAGCTG
AAAACAAAGGACCATTTCTGGAGGTGAAGATGGAGAGTTCCAAGCAGCACTTCTCCA
CCTCTGGAACGACTTCGCTTACATTGAAGTGGATGGGAAGAAGTACCCCAAGTTGGAGG
ATGGCATCCAGGTGGTGGTGATTGACGGGAACCAAGGGCGGTGGTGAGCCACACGAGC
TTCAGGAACCTCATTCTGCAAGGCATACCATGGCAGCTTCAACTATGTGGCGACCAT
CCCTGACAATTCCATAGTGCTTATGGCATCAAAGGGAAAGATACGTCTCCAGAGGCCAT
GGACCAAGAGTGCTGGAAAAGCTGGGGCAGACAGGGGTCTCAAGTTGAAGAGCAAATG
GCATTGTTGGCTTCAAAGGCAGCTTCCGGCCATCTGGGTGACACTGGACACTGAGGA
TCACAAAGCAAAATCTTCCAAGTTGTGCCCATCCCTGTTGAAGAAGAAGTGT
GAGGACAGCTGCCGCCGGTGCCACCTCGTGGTAGACTATG

Fig. 3 continued.
Nucleic acid sequence of ColoUp1
(SEQ ID NO: 4)

GCCCCCTGGCCCGAGCCGCGCCGGGCTGTGAGTAGAGCCGCCGGCACCGAGCGCT
 GGTCGCCGCTCTCCTCGTTATATCAACATGCCCCCTTCTCTGTTGCTGGAAGCCGTC
 TGTGTTTCTGTTTCCAGAGTGCCCGCATCTCTCCCTCTCCAGGAAGTCCATGTAAG
 CAAAGAAACCATCGGAAGATTCACTCAGCTGCCAGCAAATGATGTTGCTGGCTGCAG
 TGGACATCATGTTCTGTTAGATGGGCTAACAGCGTCGGAAAGGGAGCTTGAAAGG
 TCCAAGCAGCTTGCCATCACAGTCTGTGACGGCTGGACATCAGCCCCGAGAGGGTCAG
 AGTGGAGCATTCCAGTTCACTCCTCATCTGGAATTCCCCTGGATTCACTTT
 CAACCCAACAGGAAGTGAAGGCAAGAATCAAGAGGATGGTTCAAAGGAGGGCGCACG
 GAGACGGAACTTGCTCTGAAATACCTCTGCACAGAGGGTTGCCTGGAGGCAGAAATGC
 TTCTGTGCCCAGATCCTCATCGTCACTGATGGGAAGTCCAGGGGATGTGGCAC
 TGCCATCCAAGCAGCTGAAGGAAAGGGGTGTCACTGTTTGCTGTGGGGTCAGGTT
 CCCAGGTGGGAGGAGCTGCATGCACTGGCCAGCGAGCCTAGAGGGCAGCACGTGCTGTT
 GGCTGAGCAGGTGGAGGATGCCACCAACGGCCTTCAGACCCCTCAGCAGCAGCTCGGCCA
 TCTGCTCCAGCGCCACGCCAGACTGCAGGGTCGAGGCTCACCCCTGTGAGCACAGGACG
 CTGGAGATGGTCCGGGAGTTCGCTGGCAATGCCCATGCTGGAGAGGATCGCGGCGGAC
 CCTTGCGGTCTGGCTGCACACTGTCCCTACAGCTGGAAAGAGAGTGTCCCTAACCC
 ACCCTGCCACCTGCTACAGGACCACTGCCAGGCCAGGCCCCTGTGACTCGCAGCCCTGCCAG
 AATGGAGGCACATGTGTTCCAGAAGGACTGGACGGTACCAGGTGCCTCTGCCGCTGGC
 CTTTGGAGGGAGGCTAACTGTGCCCTGAAGGTGACGGCTGGAAATGCAGGGTCGACCTCC
 TCTTCCTGCTGGACAGCTCTGCCGGCACCACTCTGGACGGCTTCTGCGGGCAAAGTC
 TTCGTGAAGCGGTTTGCGGGCCGTGCTGAGCGGAGGACTCTGGGCCCAGTGGGTG
 GCCCACATACAGCAGGGAGCTGCTGGTGGCGGTGCCTGTGGGGAGTACAGGATGTGC
 CTGACCTGGCTGGAGCCTCGATGGCATTCCCTTCCGTGGTGGGCCCCACCCTGACGGGC
 AGTGCCTTGGGCAGGCGCAGGGCGAGCGGTGGCTTCGGGAGCGCCACCAGGACAGGCCAGGA
 CGGCCACGTAGGTGGTGGTTTGCTCACTGAGTCACACTCCGAGGATGAGGTTCGGG
 GCCAGCGGTACGGCAAGGGCGGGAGAGCTGCTCCCTGCTGGTGTAGGCAGTGAGGCC
 GTGCGGGCGAGGTGGAGGAGATCACAGGCAGCCAAAGCATGTGATGGTCACTCGGA
 TCCTCAGGATCTGTTCAACAAATCCCTGAGCTGCAGGGGAAGCTGTGCAGGCGCAGC
 GGCCAGGGGTCCGGACACAAGCCCTGGACCCTCGTCTCAGTTTGGACACCTCTGCCCA
 GTAGGGCCGGAGAATTTGCTGCAGTGCAGAGCTTGTGAAGAGCTGCCCTCCAGTT
 TGAGGTGAACCCCTGACGTGACAACAGGTCGGGCTGGTGGTGTTATGGCAGGCCAGGTGCAG
 CTGCCTTCGGGCTGGACCAAACCCACCCGGCTCGGATGCTGCGGGCCATAGCCAG
 GCCCCCTACCTAGGTGGGGGGCTCAGCCCGGCACCGGCCCTGTGCACATCTATGACAAA
 AGTGATGACCGTCCAGGGGGGTGGCCCTGGGTCCCCAAAGCTGTGGGTGCTC
 CAGGCGGGGAGAGGCCGCAGGAGGGATGCAGCCGTTCCTGCCCAGAAGCTGAGGAACAATGGC
 ATCTCTGTCTTGGCTCGTGGCCGTGGGGCTGTCCTAAGGTGAGGGTCTGCGGAGGGCTTC
 AGGTCCCCGGGGATCCCTGATCCACGTGGCAGTCCACGTCCGCACCTGCGGTACCCACAG
 ACGTGCTCATGTAGGTGGGTGTGGGAAGCCAAAGCGCCAGTCACCTGTCAAAACCC
 AGCCCGGTGCATGAATGAGGGCCAGGTGCGTCCGTCAGAATGGAGGTACCGCTGTCAAGTC
 TCGGGAGTGGGTGGAGGGCCCCACGTGCGAGAACCGATTCTGGAGACGCCCTTGAGGGCA
 CATGGGTCCCGGTGCAGGGAGGGCAGCAGCCGTACCCCTCCCAGACACTACAGGAAGGGCC
 TGGGCACGTGAAAATGGGTGCCTACCTGTGAATGTCTGTGCCCCAGGGTCCTTAGATGTTC
 TGCTCCCCGGCGGTGGCCAGGGACCACTATTCCAGTGAGGAGGGAGGTCCCAACTGT
 AGCCATGTGTGCTTAGGACAAGAAAGCGCTGTGAGTGTCACCACAAAGGTTTGTGA
 AAGTTTGTGAGTGTTAAGTAACCCACTTCTGTACCTGTGCCTGTGGCCTTAGGTGA

Fig. 4

Nucleic acid sequence of ColoUp2
(SEQ ID NO: 5)

TGTCATCTGCCACTTCCCTTGAGGATAAACAAAGGGTCTGAAGACTTAAATTAGC
GGCCTGACGTTCTTGCACACAATCAATGCTGCCAGAATGTTGACACAGTAATG
CCCAGCAGAGGCCTTACTAGAGCATCCTTGGACGG

Fig. 4 continued.
Nucleic acid sequence of ColoUp2
(SEQ ID NO: 5)

GCAGAGCACAGCATCGTCGGGACCAGACTCGTCTCAGGCCAGTTGCAGCCCTCTCAGCC
 AACCGCCGACCAAGGAAAACTCACTACCATGAGAATTGCAGTGATTGCTTTGCCTCC
 TAGGCATCACCTGTGCCATACCAGTTAAACAGGCTGATTCTGGAAAGTTCTGAGGAAAAG
 CAGCTTACAAACAAATACCCAGATGCTGTGGCCACATGGCTAAACCCTGACCCATCTCA
 GAAGCAGAATCTCCTAGCCCCACAGACCCCTCCAAGTAAGTCAAACGAAAGCCATGACC
 ACATGGATGATATGGATGATGAAGATGATGATGACACTGATGATTCTCACCAGTCTGATGAGTC
 GACTCGAACGACTCTGATGATGTAGATGACACTGATGATTCTCACCAGTCTGATGAGTC
 TCACCATTCTGATGAATCTGATGAACCTGGTCACTGATTTTCCCACGGACCTGCCAGCAA

CCGAAGTTTCACTCCAGTTGTCCCCCACAGTAGACACATATGATGGCCGAGGTGATAGT

GTGGTTATGGACTGAGGTCAAAAATCTAAGAAGTTCGCAGACCTGACATCCAGTACCC
 TGATGCTACAGACGAGGACATCACCTCACACATGGAAAGCGAGGAGTTGAATGGTGCAT

ACAAGGCCATCCCCGTTGCCAGGACCTGAACCGCCTCTGATTGGGACAGCCGTGGG

AAGGACAGTTATGAAACGAGTCAGCTGGATGACCAGAGTGCTGAAACCCACAGCCACAA

GCAGTCCCAGATTATATAAGCGGAAAGCCATGATGAGAGCAATGAGCATTCCGATGTGA

TTGATAGTCAGGAACTTCCAAAGTCAGCCGTGAATTCCACAGCCATGAATTCACAGC
 CATGAAGATATGCTGGTTGTAGACCCAAAAGTAAGGAAGAAGATAAACACCTGAAATT
 TCGTATTCTCATGAATTAGATAGTGCATCTTGAGGTCAATTAAAAGGAGAAAAAA
 ACAATTCTCACTTTGCATTAGTCAAAAGAAAAATGCTTATAGCAAAAATGAAAGAG
 AACATGAAATGCTTCTCAGTTATTGGTTGAATGTGTATCTATTGAGTCTGGAA

ATAACTAATGTGTTGATAATTAGTTAGTTAGTTGTGGCTTCATGGAAACTCCCTGAAAC
 TAAAGCTTCAGGGTTATGTCTATGTTCATTCTATAGAAGAAATGCAAACTATCA
 ATTTTAATATTGTTATTCTCATGAATAGAAATTATGTAGAAGCAAACAAACT
 TTTACCCACTAAAAAGAGAAATATAACATTATGTCAACTATAATCTTTGTTTTAA
 GTTAGGTATATTTTGTTGTGATTATCTTTGTTGTGAATAAAATCTTTATCTTGA
 ATGTAAATAAGAATTGGTGGTGTCAATTGCTTATTTTCCCACGGTGTCCAGCAA
 TTAATAAAACATAACCTTTTACTGCCTAAAAAAAAAAAAAAAA

Fig. 5
 Nucleic acid sequence of Osteopontin
 (SEQ ID NO: 6)

AAAGGGGCAAGAGCTGAGCGGAACACCGGCCGCGCAGCTGCTTCACCCCTC
 TCTCTGCAGCC**ATGGGGCTCCCTCGTGGACCTCTCGCGTCTCTCCTCTCCAGGTT**
 TGCTGGCTGCAGTGC**CGGGCTCCGAGCCGTGCCGGCGGTCTCAGGGAGGCTGAAGT**
 GACCTTGAGGCGGGAGGCGCGGAGCAGGAGCCCAGGC**GCTGGGAAAGTATTCA**
 TGGCTGCC**CTGGCAAGAGCCAGCTCTGTTAGCACTGATAATGATGACTTC**
 CGGAATGGCGAGACAGTCCAGGAAAGAAGGT**ACTGAAGGAAAGGAATCATTGAAGAT**
 CTTCC**CATCCAACGTATCTTACGAAGACACAAGAGAGATTGGGTGGTTGCTCCAATAT**
 CTGTC**CCCTGAAAATGGCAAGGGTCCCTCCCCAGAGACTGAATCAGCTAAGTCTAAT**
 AAAGATAGAGACACCAAG**ATTTCTACAGCATCACGGGCCGGGGCAGACAGCCCCC**
 TGAGGGTGTCTCGCTGTAGAGAAGGAGACAGGCTGGTTGTTGAATAAGCCACTGG
 ACCGGGAGGAGATTGCC**AAGTATGAGCTTTGGCACGCTGTGTCAGAGAATGGTGC**
 TCAGTGGAGGAC**CCCCTGAACATCTCCATCATCGTGACCAGACAGAACAGCC**
 CAAGTTTACCCAGGACACCTCCGAGGGAGTGTCTTAGAGGGAGTC**CTACCAGGTACTT**
 CTGTGATGCAGGTGACAGCC**ACGGATGAGGATGATGCCATCTACACCTACAATGGGTG**
 GTTGCTTACTCC**CATCCATAGCCAAGAACCAAAGGACCCACACGACCTCATGTT**
 CACC**GGGAGCACAGGCACCATCAGCGTCATCTCCAGTGGCCTGGACCGGAAAAGTCC**
 CTGAGTACACACTGACC**ATCCAGGCCACAGACATGGATGGGACGGCTCCACCACG**
 GCAGTGGCAGTAGTGGAGATC**TTGATGCCATGACAATGCTCCATGTTGACCCCCA**
 GAAGTACGAGGCC**CATGTGCTGAGAATGCAGTGGCCATGAGGTGCAAGGGCTGACGG**
 TCACTGATCTGGACGCC**CCAACTCACCGCGTGGCGTGCACCTACCTTATCATGGC**
 GGTGACGACGGGACC**ATTTTACCATACCACCCACCTGAGAGCAACCAGGCATCCT**
 GACAACCAGGAAGGGTTGG**ATTTGAGGCCAAAACCAGCACACCCGTACGTTGAAG**
 TGACCAACGAGGCC**CTTTGTGCTGAAGCTCCAACCTCCACAGCCACCATAGTGGTC**
 CACGTGGAGGATGT**GAATGAGGCACCTGTGTTGTC****CCCACCCCTCAAAGTCGTTGAGGT**
 CCAGGAGGG**CATCCCCACTGGGAGCCTGTGTTGTC****TACACTGCAGAACAGCCTGACA**
 AGGAGAAT**AAAAGATCAGCTACCGCATCCTGAGAGACCCAGCAGGGTGGCTAGCCATG**
 GACCCAGACAGTGGCAGGT**CACAGCTGTGGCACCCCTCGACCGTGAGGATGAGCAGTT**
 TGTGAGGAAC**AACATCTATGAAGTCATGGTCTTGGCCATGGACAATGGAAGCCCTCCCA**
 CCACTGGC**ACGGGACCCCTCTGTAACACTGATTGATGTCAATGACCATGGCCCAGTC**
 CCTGAGCCC**CGTCAGATCACCACCTGCAACCAAAGCCCTGTGCGCCAGGTGCTGAACAT**
 CACGGAC**AGGACCTGTCTCCCCACACCTCCCCAGCTCACAGATGACT**
 CAGACAT**CTACTGGACGGCAGAGGTCAACGAGGAAGGTGACACAGTGGTCTTGTCCCTG**
 AAGAAGTT**CCTGAAGCAGGATACATATGACGTGCACCTTCTCTGCTGACCATGGCAA**
 CAAAGAGCAG**GTGACGGTATCAGGGCACTGTGTCGCACTGCCATGGCATGTCAAA**
 CCTGCC**CTGGACCCCTGGAAAGGGAGGTTCATCCTCCCTGTGCTGGGCTGCTGGCT**
 CTGCTGTT**CCTCTGCTGGTGTGCTTTGTTGGTGAAGAAAGAGCGGAAGATCAAGGA**
 GCCCCT**CCTACTCCCAGAAGATGACACCCGTGACAACGTCTTACTATGGCGAAGAGG**
 GGGTGG**CGAAGAGGACCAGGACTATGACATACCCAGCTCCACCGAGGTCTGGAGGCC**
 AGGCC**GGGAGGTGGTCTCCGCAATGACGTGGCACCAACCATCATCCGACACCCATGTA**
 CCGTC**CCTCGGCCAGCCAACCCAGATGAAATCGCAACTTATAATTGAGAACCTGAAGG**
 CGGCT**AACACAGACCCACAGCCCCGCCCTACGACACCCCTTTGGTGTGACTATGAG**
 GGCAG**CGGCTCCGACGCCGCGTCCCTGAGCTCCCTCACCTCCTCCGCTCCGACCAAGA**
 CCAAGATT**ACGATTCTGAACGAGTGGGCAGCCGCTCAAGAAGCTGGCAGACATGT**
 ACGGTGG**CGGGAGGACGACTAGGCAGGCCTGCTGCAGGGCTGGGACCAAACGTCAGG**
 CCACAGAG**CATCTCCAAGGGTCTCAGTCCCCCTTCAGCTGAGGACTTCGGAGCTTGT**

Fig. 6

Nucleic acid sequence of ColoUp3
(SEQ ID NO: 7)

CAGGAAGTGGCCGTAGCAACTGGCGGAGACAGGCTATGAGTCTGACGTTAGAGTGGTT
GCTTCCTTAGCCTTCAGGATGGAGGAATGTGGCAGTTGACTTCAGCACTGAAAACC
TCTCCACCTGGGCCAGGGTTGCCTCAGAGGCCAAGTTCCAGAAGCCTCTTACCTGCCG
TAAAATGCTCAACCCTGTGTCCCTGGCCTGGCCTGCTGTGACTGACCTACAGTGGACT
TTCTCTCTGGAATGGAACCTTCTTAGGCCTCTGGTGCACCTTAATTTTTTTTAAT
GCTATCTTCAAAACGTTAGAGAAAGTTCTCAGGCTGAGCCCCATGCCTCCCATTGGATGGATCTC
ACTGGCCGTCCCTGCATTCTGGTTCCAGACCCCAATGCCTCCCATTGGATGGATCTC
TGCGTTTTTATACTGAGTGTGCCTAGGTTGCCCTTATTTTTATTTCCTGTTGCGT
TGCTATAGATGAAGGGTGAGGACAATCGTGTATGTACTAGAACTTTTATTAAAGA
AACTTTCCAGAAAAAAA

Fig. 6 continued.
Nucleic acid sequence of ColoUp3
(SEQ ID NO: 7)

**ATGAAGCACCTGAAGCGGTGGTGGTCGGCCGGCGGCCCTGCACCTCACCCCTCCTGCTGAGCTTGGCGGGCTCCCGTAGACCTAGATCTTACCTGCTGCTGCCGCCA
 CCCTGCTGCAGGACGAGCTGCTGTTCTGGCGGCCGGCCAGCTCCGCCTACGCGCTCAGCCCCTCTCGGCCTCGGGAGGGTGGGGCGCGCGGGCCACTGCACCCCAAGGGCCGGAGCTGGACCCCTGCCGC
 CGCCGGCCAGGGCCAGCTGCTCCCTCGCACCAGCGTGGATGCATGGCTGGTGCACAGCGTGGCTGCCGGAGCTGGCCAGGGCTGCTCCGCCGCGCTCGGGTCCCCTCGTCC
 GGGAGCGCGGACGAGGCCACAGGGCTGCTCGCGCCGCCGCGCTCGTCCACCAGGGAGGAGAAATGGGTACTAAGAGAACAGCACAGCTGTGGACGGCTCAGGGGGCGGGGGACCCCC
 AGCCGGCGCCAGCGTGGACGGCGGCAGCCAGGGCTGTGCAAGGGGGCGGGGGACCCCCGAGCGGCTCGGAGTGGCCCTTGAGCCGGGGAAAGAGGAGAACGGCACCAGCGGAACCG
 ACGGCTCAGGTGCCGGACGCTGGCGGATGTGCGAGCGAGGGAGAACGGGAGGAGAAATGGGTACTAAGAGAACAGCACAGCTGTGGACGGCTCAGGGGGCGGGGGACCCCC
 AAAGCACGAAGCTGTGGATCATAGTCTCCAGCATGAGGAAAATGAAGAAAGGGTGTCAAGCAGAGGAGAAACTCACTTCAGCAGAAATGATGATGATGAAAACAAAATAGCAGAGAAA
 CCTGACTGGGAGGCAGAAAAGACCACTGAATCTAGAAATGAGAGACATCTGAATGGGACAGATACTTCTCTGGAAAGACATTATTCCAGTTGCTTCACTCACAGCCTGAAAATT
 CACTGGAGGGCATCTCATTGGGAGATATTCTCTTCCAGGCAGTATCAGTGTGGCATG
 AATTCTTCAGCACATTATCATGTAACCTCAGCCAGGCTATAAGTCAGGATGTGAATCT
 TCATGAGGCCATCTGCTTGTCCAACAATACATTAGAAGAGATCCAACAGCAAGGA
 CTTCACAGTCACAAGAACATTCTGCAGTTAAATTCTCATACCCACCAATCCTGAGCAA
 ACCCTTCCTGGAACTAATTGACAGGATTCTTCACCGGTTGACAATCATATGAGGAA
 TCTAACAAAGCCAAGACCTACTGTATGACCTTGACATAAAATATATTGATGAGATAAACT
 TAATGTCATTGGCCACAGAACACTTTGATCCAATCGATGTTCTCAGCTTTGAT
 GAACCAGATTCTGATTCTGGCCTTCTTAGATTCAAGTCACAATAATACCTCTGT
 CAAGTCTAATTCTCACTCTGTGTGATGAAGGTGCTATAGGTTATTGCACTGACC
 ATGAATCTAGTTCCCATCATGACTTAGAAGGTGCTGTAGGTGGCTACTACCCAGAACCC
 AGTAAGCTTGTCACTGGATCAAAGTGAATTGATTCTGATTCCATGGAGATCTTACATTCA
 ACACGTATTCTATAACCACACTTACCAACTACAGCCAATGCACCAGAACATCTACTTCTG
 AACCTTTCCGTGGCCTGGGAAGTCACAGAACAGATAAGGGAGTAGATACTTGAAGAACACA
 GATAGAAACTTGAGCCGTGATGAACAGCGTGCTAAAGCTTGCATATCCCTTTCTGT
 AGATGAAATTGTCGGCATGCCGTTGATTCTTCAATAGCATGTTAAGTAGATATTATC
 TGACAGACCTACAAGTCTCACTTATCCGTGACATCAGACGAAGAGGGAAAAATAAGTT
 GCTGCGAGAACACTGTCGTAAACGCAAATTGGACATAATTGAAATTAGAAGATGATGT
 ATGTAACCTGCAAGCAAAGAACAGGAAACTCTTAAGAGAGAGCAAGCACAATGTAACAAAG
 CTATTAACATAATGAAACAGAACACTGCATGACCTTATCATGATATTGTTAGGATTA
 AGAGATGACCAAGGTAGGCCAGTCATGAACTCCAAACCAACTATGCTCTCCAGTGTACCCATGA
 TGGAAGTATCTGATAGTACCCAAAGAACACTGGTGGCCTCAGGCCACAAAAGGAAACCC
 AAAAGGAAAGAGAACAGTGAAGAACACTGAAGATGGACTCTATTATGTGAAGTAGTAA
 TGTTCAGAAACTGATTATTGGATCAGAAACCATTGAAACTGCTTCAAGAATTGTATCT
 TTAAGTACTGCTACTTGAATAACTCAGTTAACGCTGTTGAAGCTTACATGGACAAAT
 GTTTAGGACTTCAAGATCACACTTGTGGCAATCTGGGGAGCCACAACCTTCTGAA
 GTGCATTGTATACAAAATTGATCAGTTATGTCCAAAGAACAGTTAACATGAAAACCCAG
 TAAGACTTTCCATCTGGCAGCCATCCTTTTAAGAGTAAGTTGGTTACTTCAAAAAGA
 GCAAACACTGGGGATCAAATTATTTAAGAGGTATTCAGTTAAATGCAAATAGCC
 TTATTTCAATTAGTTGTTAGCACTATAGTGAAGCTTCAAAACACTATTTAATCTT
 ATATTTAACTTATAAATTGCTTCTATGGAAATAAATTGTATTGTATTAAAAAA
 AAAAAAA**

Fig. 7
Nucleic acid sequence of ColoUp4
(SEQ ID NO: 8)

ATGAAGTTGGAGGTGTTCGTCCCTCGCGCGGCCACGGGACAAGCAGGGCAGTGACCT
GGAGGGCGCGGCAGCGACGCGCCGTCCCGCTGTCGGCGGCCAGAGACTCCC
TGGGCTCAGATGGGACTGCGCGCCAAGCCGTCCCGGGCGGCCAGAGATAACG
CAGGGCGACGGCGAACAGAGTGCAGGGAGGGCGGCCGGAGGAGGGCATCCC
AGCAGCTGCTGCAGCGGTGGTGGCGAGGGCGGGAGGCCGGCGGGCCAGGCG
CGGGCGCGCGGGAGCGCGAGGGTGCACGCAGCAAGCCATATACGGCGGGCCAAG
CCCCCCTACTCGTACATCGCGCTCATGCCATGCCATCCGCGACTCGGCGGGCG
CTTGACGCTGGCGGAGATCAAACGAGTACCTCATGGCAAGTTCCCCTTTCCGCG
GCTACACGGGCTGGCGCAACTCCGTGCGCCACAACCTTCGCTAACGACTGCTTC
AAGGTGCTGCGCGACCCCTCGCGGCCCTGGGCAAGGACAACACTGGATGCTAACCC
CAACAGCGAGTACACCTTCGCGACGGGTCTTCCGCCCGCGCAAGCGCTCAGCC
ACCGCGCGCCGGTCCCCCGGCCCGGGCTGCGGCCCGAGGAGGCCCGGGCTCCCC
GCCCGCCGCCCGCGCCCGCCGCCGCCGGCCTCGCCCCCGCATGCGCTGCCGCC
GGAGGAGCGCGCCAGCCCCGCGGGCAAGTTCTCCAGCTCCTCGCCATCGACAGCATCC
TGCGCAAGCCCTTCCGAGCCGTCGCCTCAGGGACACGGCCCCGGACGACGCTTC
TGGGGCGCCCGGCCCTGCCCGCTGCCCGCTGCCGTTCCCCCGCGCTCTCCCC
CTGCAGGGCCCTGCTGCCGCTCGCGCTACGGCGCGGGCGAGCCGGCGCTGGCG
CGCGCGAGGCCGAGGTGCCACCGACCGCGCCGCCCTCTGCTTGACCTCTCC
GCGCCCGCCAAAGCCACTCCGAGGCCGGCGGCCGGCGCACCTGTACTGCC
CCTGCGGCTGCCCGAGCCCTGCAGGGCGCTTAGTCCGNCGTCCCTGGCCCG
CGTACCCGGTGGAGACGCTCCTAGCTTGA

Fig. 8
Nucleic acid sequence of ColoUp5
(SEQ ID NO: 9)

GGCAGATGAAATATAAGATTCAACCACATTGACAGCCCATTGGCAGGTTCTGTT
 TTCCATCGTCCCTCTGCAGGTACAGACACACAGAGCCCAGCCGTGGCAGGCTAGCCG
 GGGTCCGGGCTGCTAACAAACGGCTACATTCCCTCCCCAGGGCAAGGGAAATCCTGAG
 CGCAGGCCAGGGTTGTTGGTTGAGGTGTGGATGAAAGGCACCTGGAAGTGG
 AAGGTTCGGTCAATTCAATTAAATTACATCTATAATTGAGGGTTGTTCTTAAGAGCG
 AGTCCTTGAAAGTACTTCCCTAACACAGTGAUTGCCACAAAGGCATCAGATATTCAC
 CACCTTCTCGGCTGCCTCAGCACAGCAAGCTTATTCTGGACCTGAGATCCTGTTCTG
 AGCTGGCTTCCCTCTCCAGGCTCGCTCACCTCCCTTAGAGATAGTGGATGGTAAG
 ATGACCAATGCTCAGATTATTCTCTATTGACAATGCCAGGATGGCAGTGGATGACTT
 CAACCTCAAGAAATGGAGAAGCATCATGTGCCAAGTGACTTCATGTCAATGTCAATGT
 GGATACAGGTCCAGGGAAAGATCTGATTAAGGTCTGGAGGATATGAGACAAGAATATG
 AGCTTATAATAAGAAGAAGCATCGAGACTTGGACACTTGGTATAAGAACAGTCTGCA
 GCCATGTCCCAGGAGGCAGCCAGTCCAGCCACTGTGCAGAGCAGACAAGGTGACATCCA
 CGAACTGAAGCGCACATTCCAGGCCCTGGAGATTGACCTGCAGGCACAGTACAGCACGA
 AATCTGCTTGGAAAACATGTTATCCGAGACCCAGTCTCGGTACTCCTGCAAGCTCCAG
 GACATGCAAGAGATCATCTCCACTATGAGGAGGAAGTGACGCAGCTACGCCACGA
 GGAGCGGCAGAACATGAATAACCAAGTGCTGCTGGCATCAAAACCCACCTGGAGAAGG
 AAATCACCACGTACCGACGGCTCCTGGAGGGAGAGATGAAGGGACACGGGAAGAATCA
 AAGTCGAGCATGAAAGTGTCTGCAACTCCAAAGATCAAGGCCATAACCCAGGAGACCAT
 CAACCGAAGATTAGTTCTTGTCAAGTGAAATCCAAAGCACGCATGAGACCAAT
 GAAAGTTCCGCCTGTTGAAATCTATTTCCCCAAGGAAAGTCCTGCACAGACAC
 CAGTGAGTGAGTTCTAAAAGATAACCCCTGGAATTATCAGACTCAGAAACTTTTATTTT
 TTTTCTGTAACAGTCTCACCAAGACTCTCATAATGCTCTTAATATATTGCACTTTCT
 AATCAAAGTGCAGTTATGAGGGTAAAGCTCTACTTCCACTGCAGCCTCAGATTC
 TCATCATTTCGATCTATTTGTAGCCAATAAAACTCCGCACTAGCAAAAAAA

Fig. 9
 Nucleic acid sequence of ColoUp6
 (SEQ ID NO: 10)

TTTTTTTTAAAAAGAGGCTTGGTAAGTTTGATGCTTAGTTGACTTTAGCATT
ATCCAGCATTGTATTATGAACCAGTGAGTACTGTAATTTTCTTCCTTCAGAAAG
ACTCAAAGGAAACATATAAATGTTCTATTAAATGTGGCAATAGTAGCTAACAC
TGGTACAGACGGAATAAACACACCTCTAATATTCTCCTGAAGATTTGGTATCCAGTT
CAAATAAGGTATGGAAAAACAGATGTTTCATTATGCCACTTAATCCTTACTTCCGA
TTATAATTATAACATGTTGGCTGTAATAACTATACTAAAGCATGCTTGTGAAAGTAGAC
TTCTACAAGGACAGAAAACCCACAACAAGATCGATCACGAAAGACAAGGCATA

Fig. 10
Nucleic acid sequence of ColoUp7
(SEQ ID NO: 11)

CTTTCTTCGCACGGTGGAGGAGGTGGCTGGTTATCGGGAGTTGGAGGGCTGAGGT
 CGGGAGGGTGGTGTACAGAGCTAGGACTCACGCCAGTCGCGGATTTG
 GGCGAGGCCTGGTTACAAGCAGCAAGTGCAGGGTGGGCCACTGCAGGCCGTTT
 AGAAAACGTTAAACAAAGAGCAATTGATGGATAAAATCAGGAATAGATTCTCTTGAC
 CATGTGACATCTGATGCTGTGGAACCTGCAAATCGAAGTGATAACTCTCTGATAGCAG
 CTTATTTAAAACCTCAGTGTATCCCTACTCACCTAAAGGGAGAAAAGAAACCCCATC
 GAAAATTGTTCGTACACCTGAAAGTGTACAGCAAGTGATTCAAGTGACTCATCT
 TTTGAACCAATACCATTGACTATAAAAGCTATTTGAAAGATTCAAGAACAGGAAAAA
 GAGATATAAAAAAAAGAAAAAGAGGAGGTACCAAGGAAAGACCACGGGGAAAGAC
 CAGAAGGAAGGAGAAATCCTATATACTCACTAATAGATAAGAAGAAACAATTTAGAAGC
 AGAGGATCTGGCTTCCCATTAGAATCAGAGAATGAAAAAACGCACCTGGAGAAA
 AATTAAACGTTGAGCAAGCTGTTGCAAGAGGATTTTTAACTATATTGAAAAGCTGA
 AGTATGAACACCACCTGAAAGAACATCATTGAAGCAAATGAATGTTGGTGAAGATTAGAA
 AATGAAGATTGACAGTCGTAGATAACAAATTGGATGATGATGGATCCATTCTCC
 TATTGAGGAGTCAACAGCAGAGGATGAGGATGCAACACATCTGAAGATAACGAATGTG
 ATATCAAATTGGCAGGGATAGTTCATAGTAAGTTCTGAATTCCCTGTAAGACTGAGT
 GTATACTTAGAAGAAGAGGATATTACTGAAGAAGCTGCTTGTCTAAAAGAGAGCTAC
 AAAAGCCAAAATACTGGACAGAGAGGCCTGAAAATGTGACAGGATCATGAATGTCAAA
 GGCTTTATCTGAGAACATGGTGTCTGGAGTTAAAGGTATTGGCATACTCCACACATC
 TGTACCATCTTGAGTGATCGCTTAGGAATGAATGTGATTGAACTCATGTTGAG
 AGGGTGTCAAATTGAGAACCAAGGTAGATCCCCACCACTACAGTAAAAGGACCCCTAAA
 GTAAATTGGTTGAAGAAATTAGATCCCAAAGATTCTTGGTGAATTGAAAGTCTTCATC
 AGTATATCCATATTAAAACGAGATGACAGAACGCAAAGTAATTATGCAAGTAATGGTT
 TTTATCTTAACTATAAGTTATTGCTCAAGGGTGTAAATGGTCACTACCAAGGCTTTAG
 AATGCAGTTCTCATTTGCTGTGGACATGACCATAAAAAAAATTCCAGTAGGTTT
 CTATCTGCTACGTTGCTAGCAATCAGTTATTGGAACAGTTGATTAACTGTAATAGAA
 ATGCAATACAAATAAAATGTGAACCACATGTGATTCTTTAAATCACTGAGATTG
 AAAATTCTCTAGATCTCTGAAATCATGCAAATTGCTTATATTGTAACCCCT
 TGTGGGTTGCTAATAACCAAGCAGTTGTAGTAGGTTAACTCAGGCTCGTTCTAGGGA
 CTCATTGCTACACTGACTCATCTGGAAATGTTAAATTACTTTATAC
 TATTGTTATGTAGGGCTGACAGGACAACGGATCAGTTCACTAAAAAGGTATGTATGC
 ATTAGAAAAGACATTGTATGGTCATTCAAAGAGGGCTTATGAGGCTGTGAAACCCA
 GAGCTCTAACGCTGTGACCAAAGATGGAAGTTCTATAGGAAGCCATAGCACTCCTA
 ATGTTGGTGTATGTTCTGAGGAGATATAAAACGTAATAATCCATGATTGTTGCC
 ATGTGAGAGTTAAAGGTTAATCAAATTCTCTTCTCAGGGCAAACCTGAAAGATAA
 ATCTTTGACTCCAGCTTTAGAGGATCTAAAGTGACCTTGATGGACAGTGGAAAGAAA
 TCACAACATGGAATTCTCGAATAACAATTATTGACTTTAAATAATTGCTAATGC
 TACATATACACAATTAAAAACCTTACACTATTCTAGAAAGTCAGCATGTATTTG
 GCTCGAAGTTCTCTAGTGTGGAAGGAATAAAAATTGAGTTCAAAAAAAA
 AAAAAAAAAAAAAAAAAAAAAAAA

Fig. 11
 Nucleic acid sequence of ColoUp8
 (SEQ ID NO: 12)

MGAAGRQDFLFKAMLTISWLTLCFPGATSTVAAGCPDQSPELQPWNPGHDQDHVHIG
 QGKTLLLTSATVSIHISEGGKLVIKDHEPIVLRTRHILIDNGGELHAGSALCPFQG
 NFTIILYGRADEGIQPDIFYGLKYIGVGKGGALELHGQKKLSWTFLNKTILHPGGMAEGG
 YFFERSWGHRGVIVHVIDPKSGTVIHSDRFDTYRSKESERLVQYLNAPDGRILSVAV
 NDECSRNLDDMARKAMTKLGSKHFLHLGFRHPWSFLTUVKGNPSSVEDHIEYHGRGSA
 AARVFKLFQTEHGEYFNVSLSSEWVQDVEWFDHDKVQTKGEKISDLWKAHPGKI
 CNRPIDIQATTMDGVNLSTEVVYKKGQDYRFACYDRGRACRSYRVRFLCGKPVRPKLT
 TIDTNVNSTILNLEDNVQSWKPGDTLVIASTDYSMYQAEEFQVLPSCRSCAPQVKVAGK
 PMYLHIGEEIDGVDMRAEVGILLSRNIVMGEMEDKCYPYRNHICNFFDFDTFGGHIKFA
 LGFKAAHLEGTELKHMGQQLVGQYPIHFHLAGDVDERGGYDPPTYIRDLSIHHTFSRCV
 TVHGSNGLLIKDVVGYNLSGHCFTEGPEERNTFDHCLGLLVKGTLPSDRDSKMCK
 MITEDSYPGYIPKPRQDCNAVSTFWMANPNNNLINCAAAGSEETGFWFIFHHVPTGPSV
 GMYSPGYSEHIPLGKFYNNRAHSNYRAGMIIDNGVKTTEASAKDKRPFLSIIISARYSPH
 QDADPLKPREPAIIRHFIAYKNQDHGAWLRGGDVWLDSRFCADNGIGLTLASGGTFPYD
 DGSKQEIKNSLFVGESGNVGTEEMMDNRIWGPGGLDHSGRTLPICQNFPIRGIQLYDGPI
 NIQNCTFRKFVALEGRHTSALAFLRNNAWQSCPHNNVTGIAFEDVPITSRVFFGEPGPW
 FNQLDMGDKTSVFHDVDGSVSEYPGSYLTKNDNWLRHPDCINVPDWRGAICSGCYAQ
 MYIQAYKTSNLRMKIIKNDFPSHPLYLEGALTRSTHYQQYQPVVTLQKGYTIHWDQTAP
 AELAIWLINFNKGDWIRVGLCYPRGTTFSILSDVHNRLLKQTSKTVFVRTLQMDKVEQ
 SYPGRSHYYWDEDGQFLKLKAQNEREKFAFCMKGcerIKIKALIPKNAGVSDCTAT
 AYPKFTERAVVDVPMPKKLFGSQLTKDHFLEVKMESSQHFFHLWNDFAYIEVDGKKY
 PSSEDGIQVVVIDGNQGRVVSHTSFRNSILQGIPWQLFNYVATIPDNSIVLMASKGRYV
 SRGPWTRVLEKLGADRGLKLKEQMAFVGFKGSFRPIWVTLTDEDHKAKIFQVVPIPVVK
 KKKL

Fig. 12
 Amino acid sequence of full-length ColoUp1 protein
 (SEQ ID NO: 13)

MPPFLLLEAVCVFLFSRVPPSLPLQEVHVKETIGKISAASKMMWCSAAVDIMFLLDGS
NSVGKGSFERSKHFAITVCDGLDISPERVRVGAFQFSSTPHLEFPLDSFSTQQEVKARI
KRMVFKGGRTETELALKYLLHRGLPGGRNASVPQILIIVTDGKSQGDVALPSKQLKERG
VTVAVGVRFPRWEELHALASEPRGQHVLLAEQVEDATNGLFSTLSSAICSSATPDCR
VEAHPCEHRTLEMVREFAGNAPCWRSRRTLAVLAHCPYSWKRVFLTHPATCYRTTC
PGPCDSQPCQNGGTCVPEGLDGYQCLCPLAFGGEANCALKLSLECRVDLLFLLDSSAGT
TLDGFLRAKVFVKRFVRAVLSEDSRARVGATYSRELLVAVPVGEYQDVPLVWSLDGI
PFRRGGPTLTGSALRQAAERGFGSATRTGQDRPRVVLLTESHSEDEVAGPARHARARE
LLLLGVGSEAVRAELEEITGSPKHVMVYSDPQDLFNQIPELQGKLCSRQRPCRTQALD
LVFMLDTSASVGPNFAQMGSFVRSCALQFEVNPDVTQVGLVVYGSQVTAFLDTKPT
RAAMLRAISQAPYLGGVGSAGTALLHIYDKVMTVQRGARPGVPKAVVVLGGGRAEDAA
VPAQKLRNNNGISVLVVGVGPVLSEGLRRLAGPRDSLIIHVAAYADLRYHQDVLIEWLCGE
AKQPVNLCKPSPCMNEGSCVLQNGSYRCKCRDGWEGPHCENRFLRRP

Fig. 13

Amino acid sequence of full-length ColoUp2 protein
(SEQ ID NO: 14)

MRIAVICFCLLGITCAIPVKQADSGSSEEKQLYNKPDAVATWLNPDPHQKQNLLAPQT
LPSKSNESHDHMDMDDDEDDDHVDSQDSIDSNDSDVDDTDDSHQSDESHHSDESDEL
VTDFPTDLPATEVFTPVVPTVDTYDGRGDSVYGLRSKSKFRRPDIQYPDATDEDITS
HMESEELNGAYKAIPIVAQDLNAPSDWDSRGKDSYETSQLDDQSAETHSHKQSRLYKRKA
NDESNEHSDVIDSQELSKVSREFHSHEFHSHEDMLVVDPKSKEEDKHLKFRISHELDSA
SSEVN

Fig. 14
Amino acid sequence of full-length Osteopontin protein
(SEQ ID NO: 15)

MGLPRGPLASLLLLQCVWLQCAASEPCRAVFREAEVTLEAGGAEQEPEGQALGKVFMGCP
GQEPAFLSTDNDDFTVRNGETVQERRSLKERNPLKIFPSKRILRRHKRDWVVA
PISVPE
NGKGPFPQRNLNQLKSNKDRDTKIFYSITGPGADSPPEGVFAVEKETGWLLL
NKPLDREE
IAKYELFGHAVSENGASVEDPMNISIIVTDQNDHKPKFTQDTFRGSVLEGVL
PGTSVMQ
VTATDEDDAIYTNGVVAYSIHSEQEPKDPHDLMFTIHRSTGTISVISSGL
DREKVPEYT
LTIQATDMGDGSTTAVAVVEILDANDNAPMFDPQKYEAHVPENAVGHEV
QRLTVTDL
DAPNSPAWRATYLI
MGGDDGDHFTITTHPESNQGILTTRKGLDFEAKNQHTLYVEVTNE
APFVLKLPTSTATIVVHVEDVNEAPFVPPSKVVEVQEGIPTGE
PVCVYTAEDPDKENQ
KISYRILRDPAGWLAMD
PDSGQVTAVGTL
DREDEQFVRNNIYE
VMVLAMDNGSP
TTGT
GTLLLTLIDVNDHGP
VPEPRQITICNQSP
VRQVLNITDKDLS
PHTSPFQAQL
TDDSDIY
WTAEVNEEGDTV
VLSLKKFLKQD
TYDVHLSLSDHGN
KEQLTVIRAT
VCDCHGH
VETCPG
PWKG
GGFILPV
LGAVI
ALLF
LLL
V
LLL
VRKKR
KI
KE
PL
LP
ED
DD
ED
QDY
DIT
QLH
RGLEAR
PEV
VLR
NDV
AP
TII
IPT
PMY
R
PR
P
A
N
P
D
E
I
GN
F
I
I
E
N
L
KA
ANT
DPTAPPY
DTLL
VFDYEG
SGSDA
ASL
SSLT
SSASD
QD
QDY
DYL
NEW
GSRF
KKL
ADM
Y
GGG
EDD

Fig. 15

Amino acid sequence of full-length ColoUp3 protein
(SEQ ID NO: 16)

MKHLKRWW SAGGGLLH LTLLS LAGL RVDLDLYLLLPPPTLLQDELLFLGGP ASSAYAL
SPFSASGGWGRAGHLHPKGRELDP AAPPEGQ LLREVRALGV PFV PRTSVD A LVHS VAA
GSADEAHGLLGAAAASSTGGAGASVDGGSQAVQGGGGDPRAARSGPLDAGEEEKA PAEP
TAQVPDAGGCASEENGVLREKHEAVDHSSQHEENEERVSAQKENS LQQNDDDENKIAEK
PDWEAEKTTESRNERHLNGTDTFSLEDLFQLLSSQPENSLEGISLGDIPLPGSISDGM
NSSAHYHVNF SQAI SQDVNLHEA ILLCPNNTFRRDPTARTSQSQEPFLQLNSHTTNPEQ
TLPGTNLTGFLSPVDNHMRNLTSQDL LYDLDINIFDEINLMSLATEDNFDPIDVSQLFD
EPDSDSGLSLDSSHNNNTSVIKSNSSHSV CDEGAIGYCTDHESSSHHDLEGAVGGYYPEP
SKLC HLDQSDSDFHGDLTFQHFHNHTYHLQPTAPESTSEPF PWPGKSQKIRSYLEDT
DRNLSRDEQRAKALHI PFSVDEIVGMPVDSFN SMLSRYYLTDLQVSLIRD IRRRGKNKV
AAQNCRKRKL DII LNLEDDVCNLQAKKETLKREQAQCNKAINIMKQLHDLYHDIFSRL
RDDQGRPVNP NHYALQCTHDGSILIVPKELVASGHKKETQKGKRK

Fig. 16

Amino acid sequence of full-length ColoUp4 protein
(SEQ ID NO: 17)

MKLEVFPRAHGDQGSDLEGAGGSAPSPLSAAGDDSLGSDGDCAAKPSAGGGARDT
QGDGEQSAGGGPGAEAEAI PAAAAAAVVAEGAEAGAAGPGAGGAGSGEGARSKPYTRRPK
PPYSYIALIAMAIRD SAGGR LTLAEINEYLMGKF PFFRGSYT GWRNSVRHNLSLNDCFV
KVL RDPSRPWGKDNYWMLNPNSEYTFADGVFRRRKRLSHRAPVPAPGLRPEEAPGLPA
APP PAPA APAS PRMRSPARQEERASPAGK FSSSFAIDSILRKPF RSRLLRDTAPGTTLQ
WGAAPCPPLPAFPALLPAAPCR ALLPLCAYGAGEPARLGAREAEVPPTAPPLLLAPLPA
AAPAKPLRGPAAGGAHLYCPLRLPAALQAALVRRPGPHLSYPVETLLA

Fig. 17

Amino acid sequence of full-length ColoUp5 protein
(SEQ ID NO: 18)

MEKHHVPSDFNVNVKVDTGPREDLIKVEDMRQEYELI I KKKHRDLDTWYKEQSAAMSQ
EAASPATVQSRQGDIHELKRTFQALEIDLQAQYSTKSALENMLSETQSRYSCQLQDMQE
I I SHYEEELTQLRHELERQNNEYQVLLGIKTHLEKEITTYRRLLEGESEGTREESKSSM
KVSATPKIKAITQETINGRLVLCQVNEIQKHA

Fig. 18

Amino acid sequence of full-length ColoUp6 protein
(SEQ ID NO: 19)

MDKSGIDS LDHVTSDA VELANR SDNSSDSSL FKTQCIP YSPKGEKRNP I RKFVRTPESV
HASDSSSDSSF EPIPLTIKAIFERFKNRKKRYKKKKR RYQPTGRPRGRPEGRRNPIYS
LIDKKQFRSRGSGFPFLESENEKNAPWRKILT FEQAVARGFFNYIEKLKYEHHLKESL
KQMNVGEDLENEFD SRRYKF LDDGSISPIEESTAEDDA THLEDNECDIKLAGDSFI
VSSEFPVRLSVYLEEEDITEAAALSKRATKAKNTGQRGLKM

Fig. 19

Amino acid sequence of full-length ColoUp8 protein
(SEQ ID NO: 20)

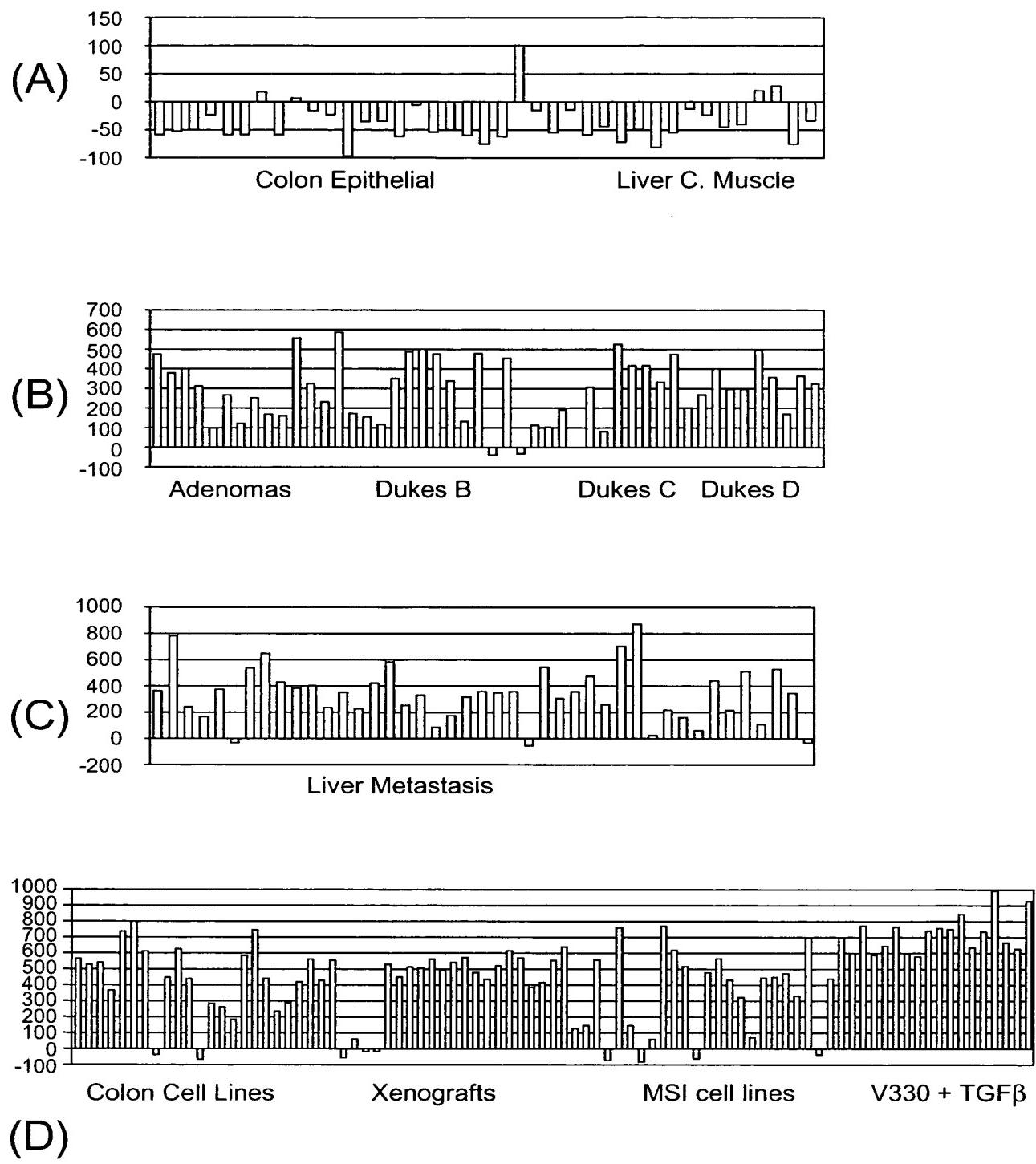


Fig. 20

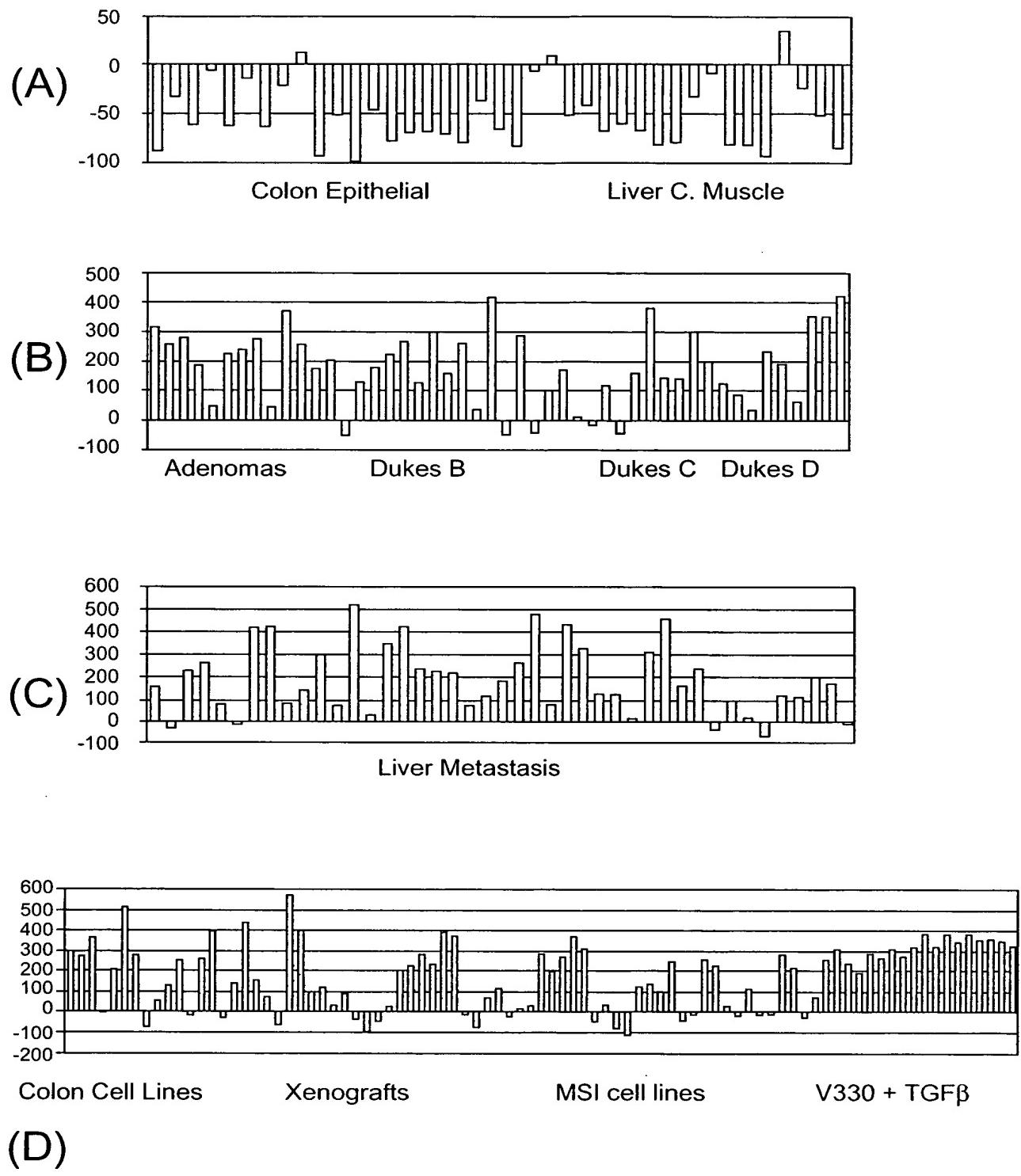


Fig. 21

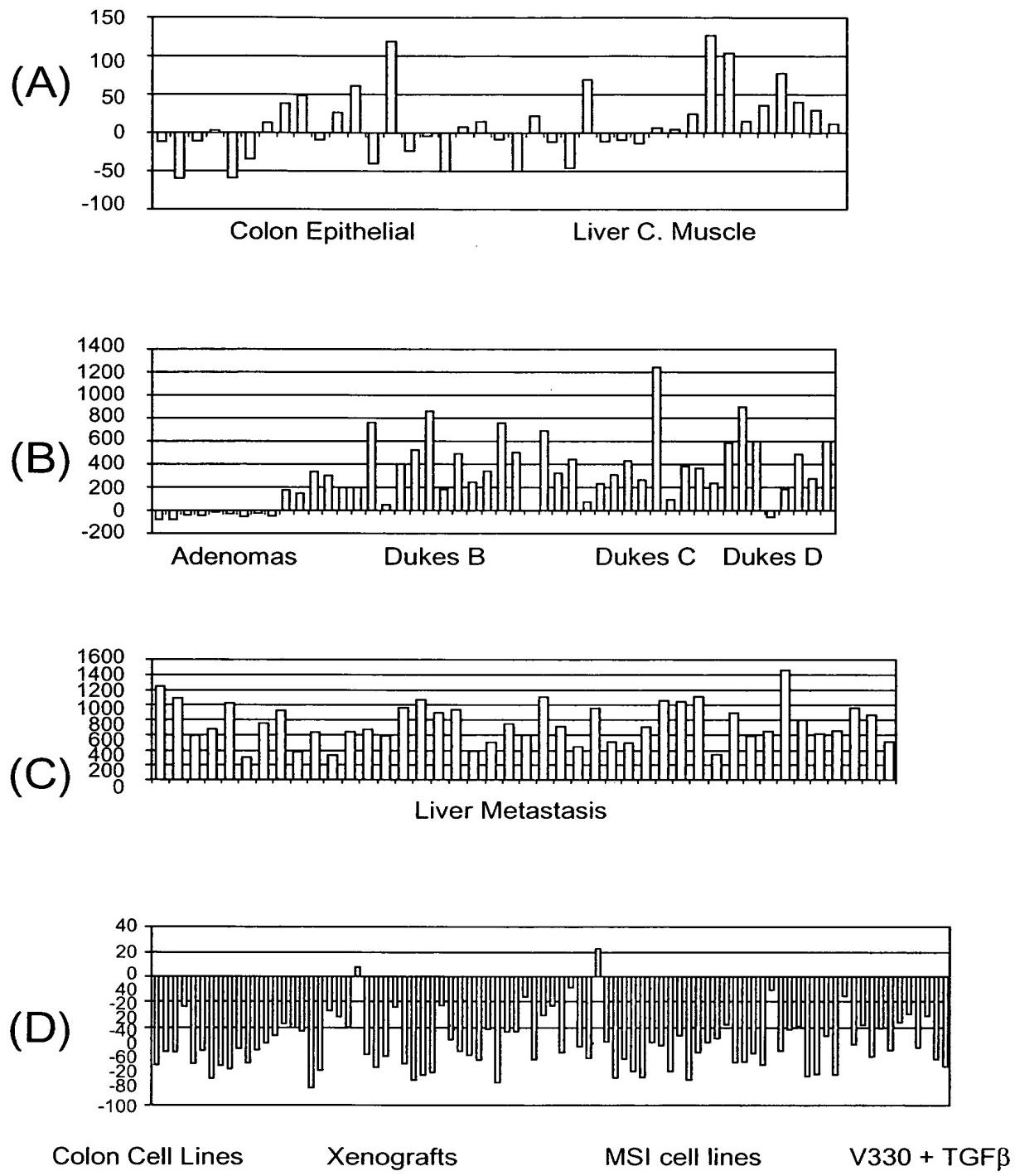


Fig. 22

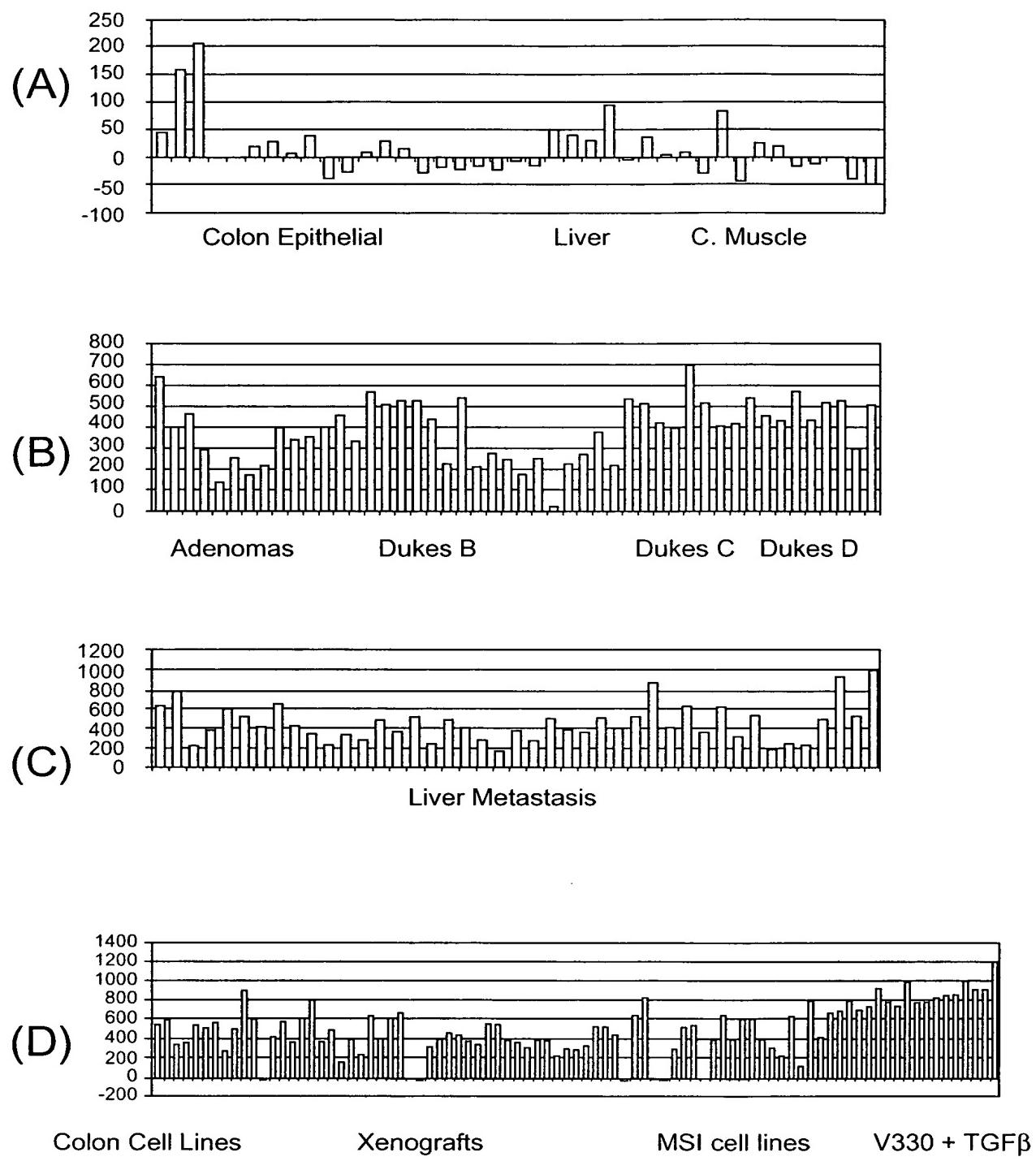


Fig. 23

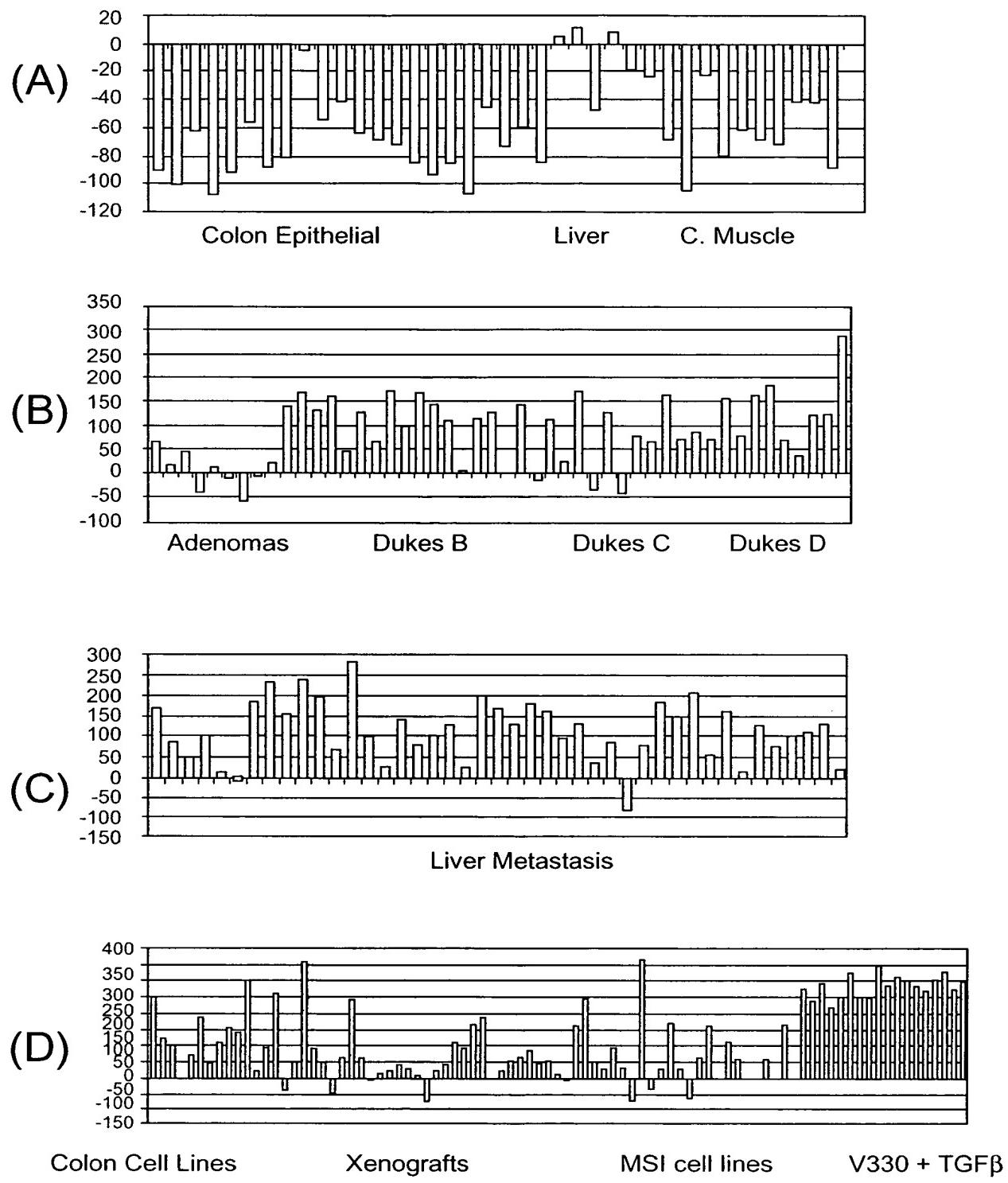


Fig. 24

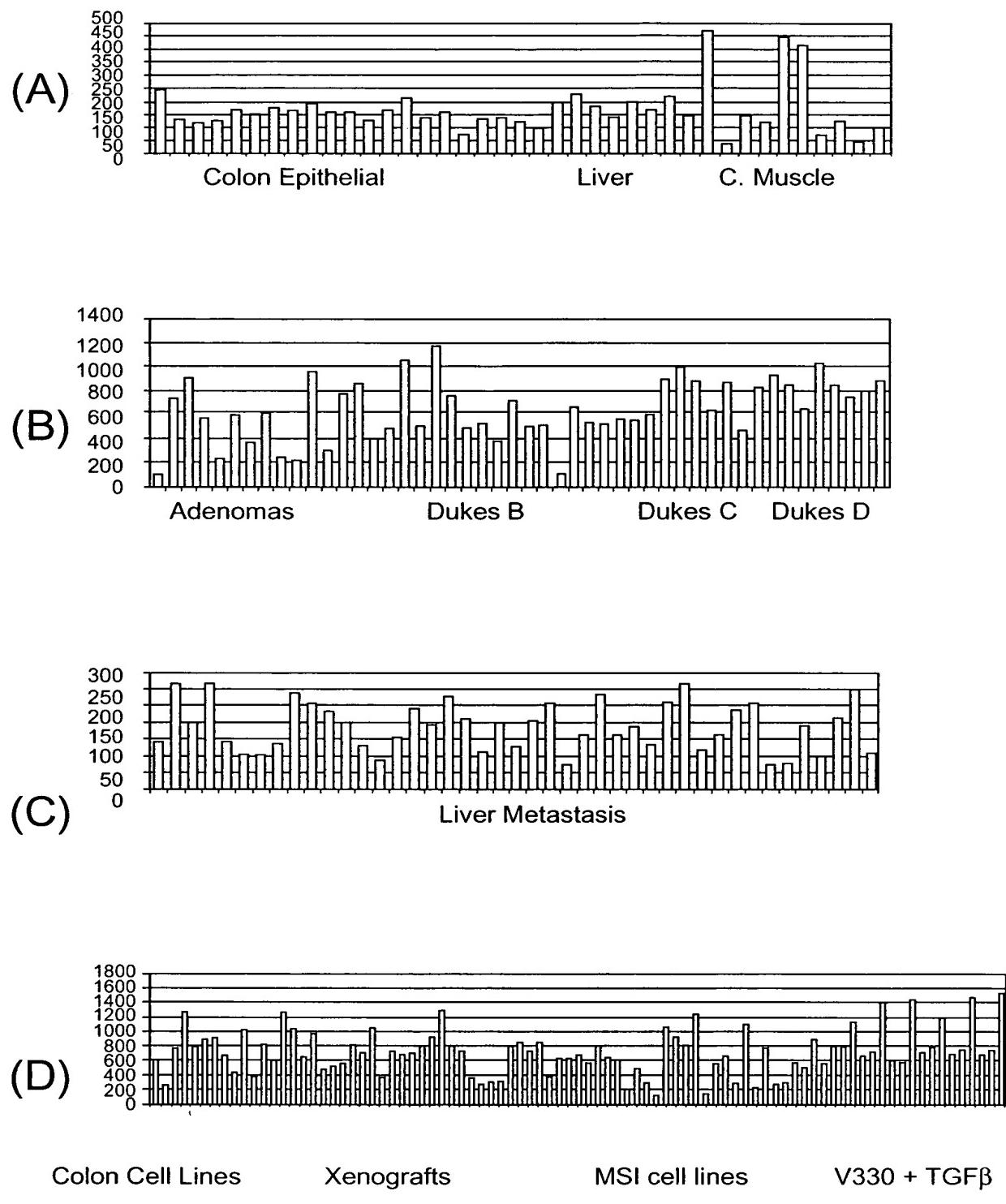


Fig. 25

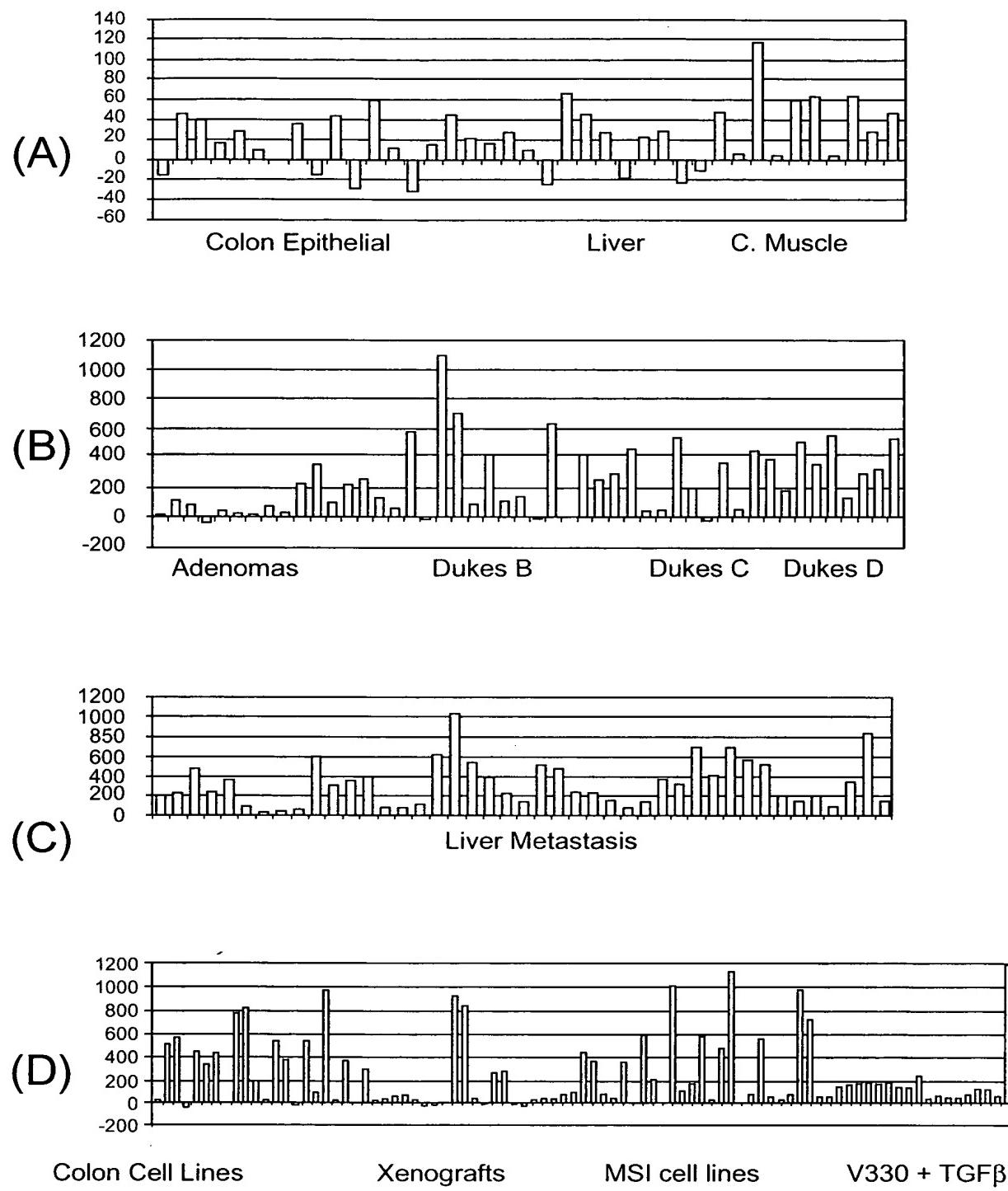


Fig. 26

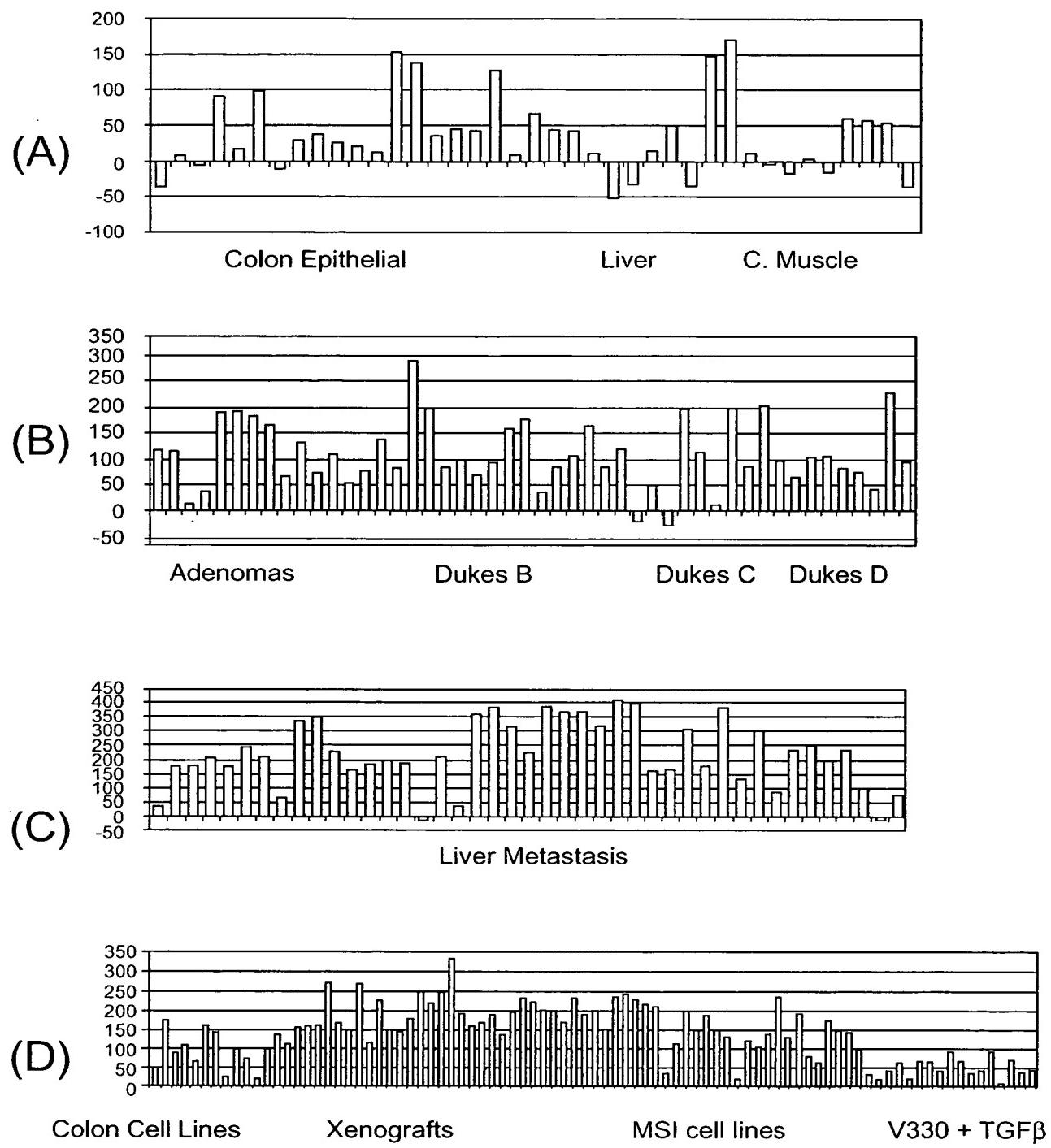


Fig. 27

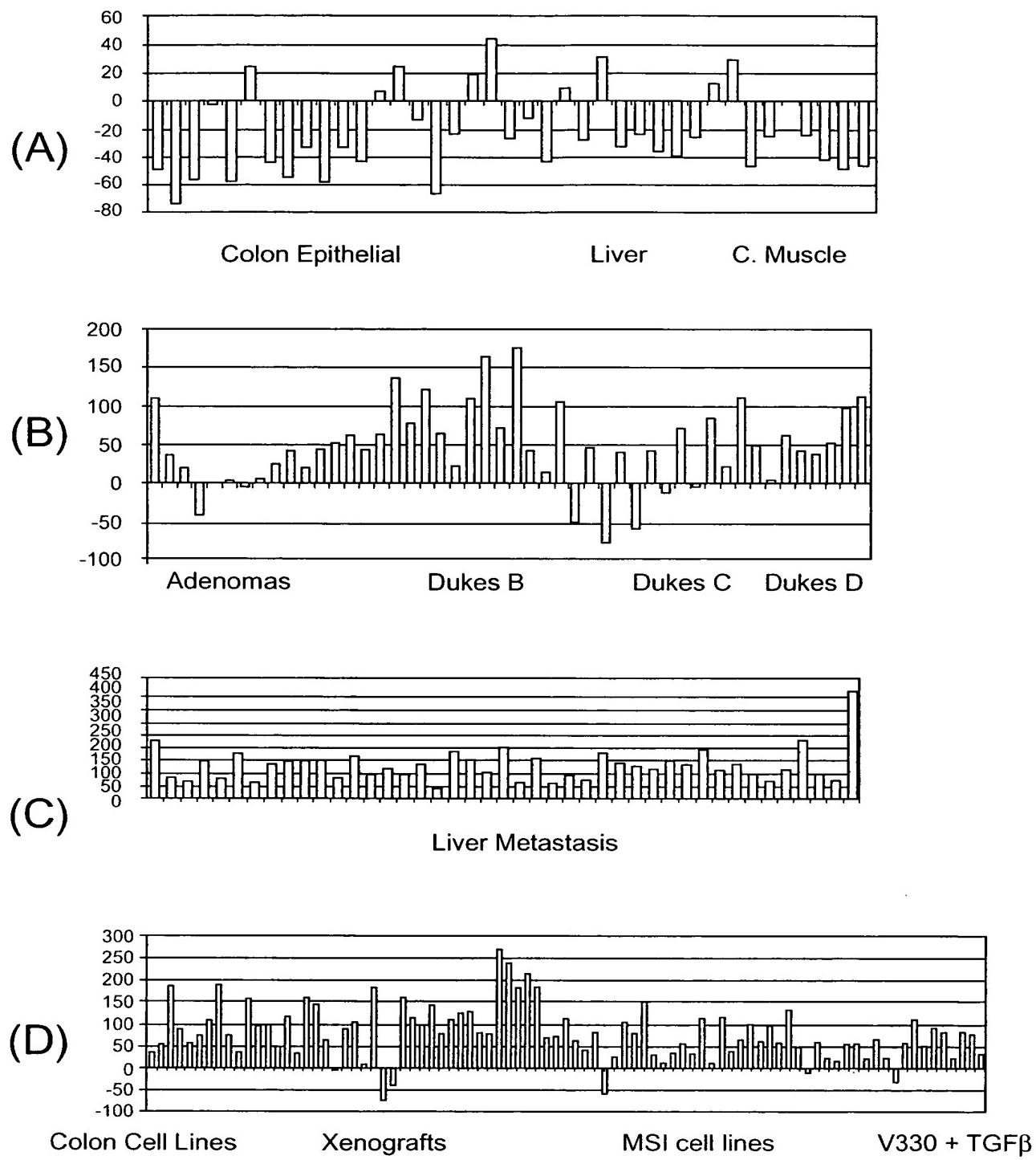


Fig. 28

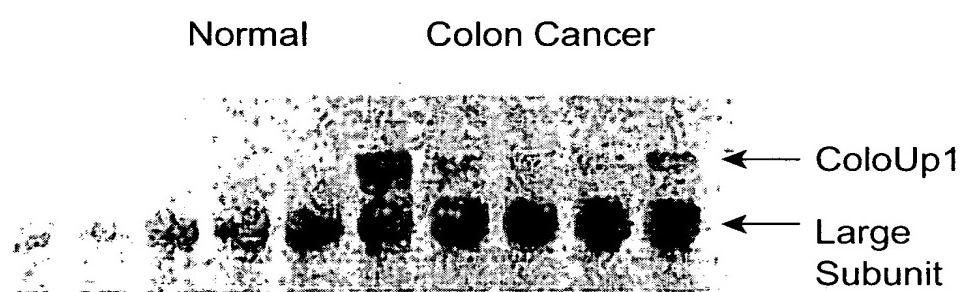


Fig. 29A

SAMPLE:

7774	7824	7583	8668	8677	8681	4253	4297
N	T	N	T	N	T	N	T

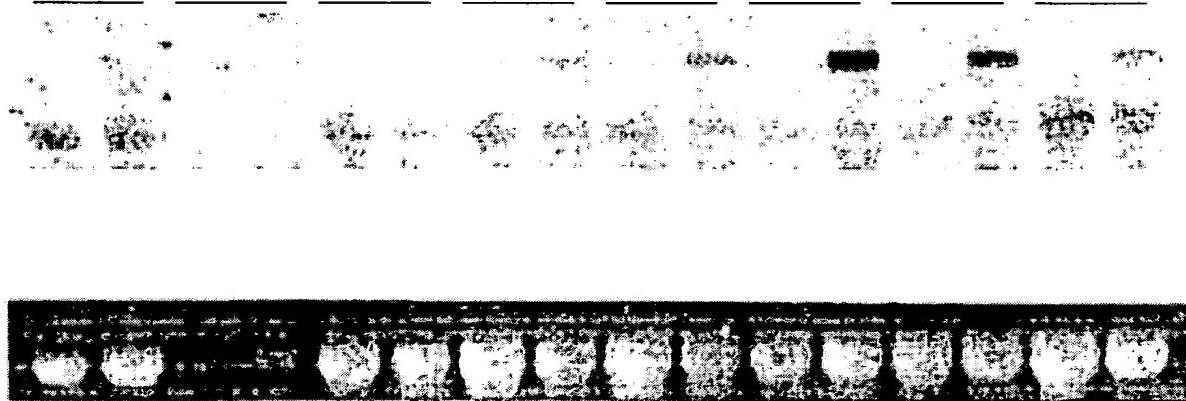


Fig. 29B

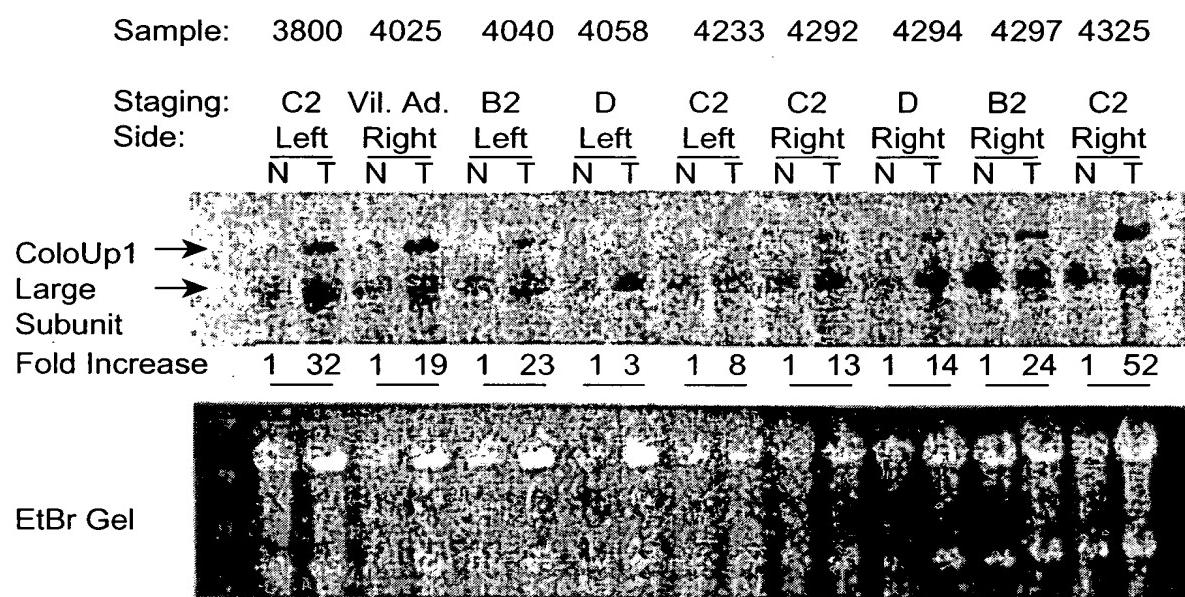


Fig. 29C

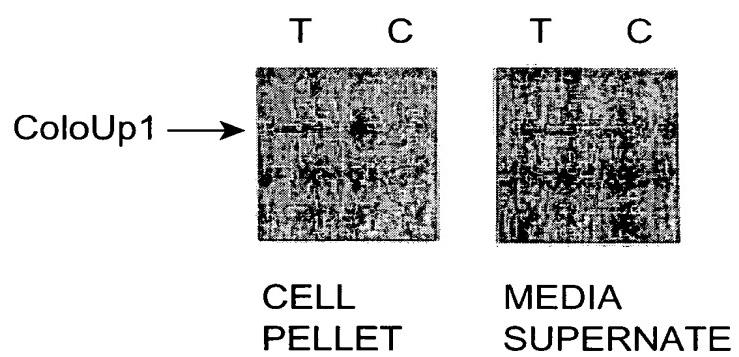


Fig. 30A

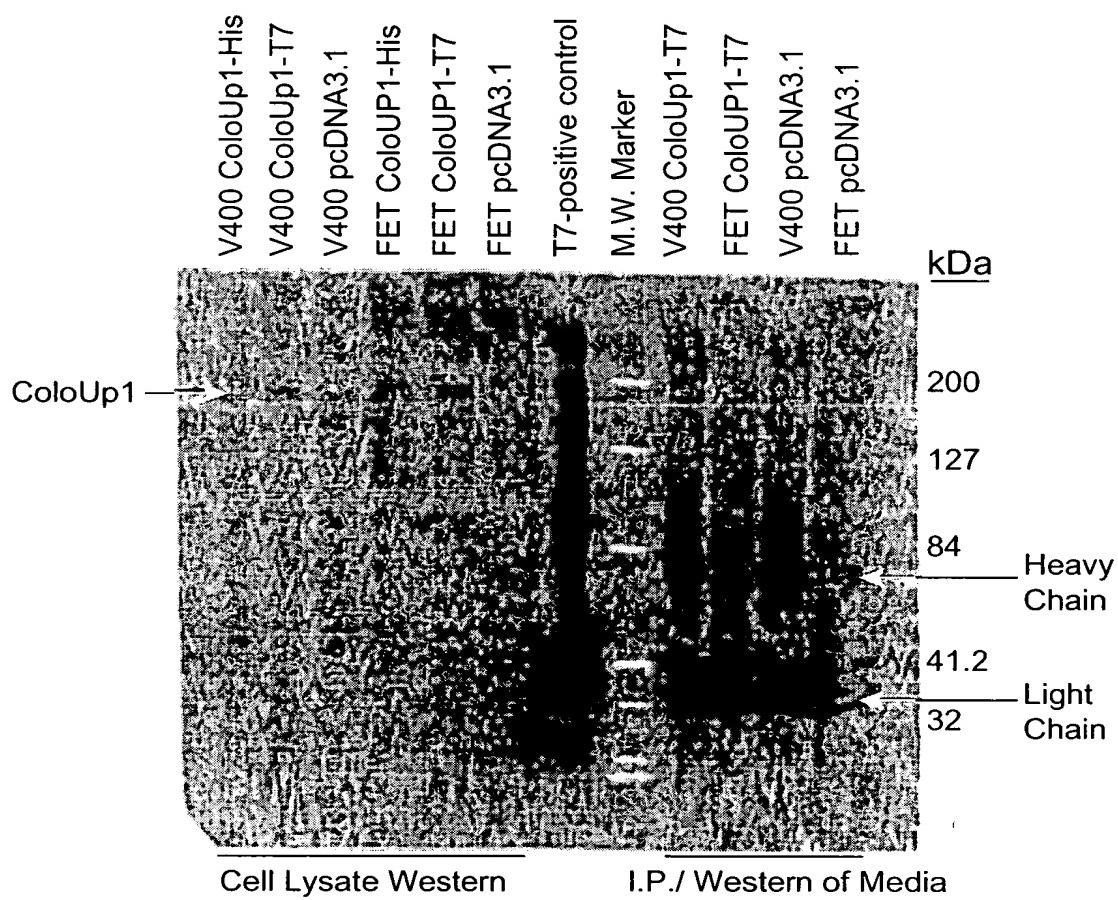


Fig. 30B

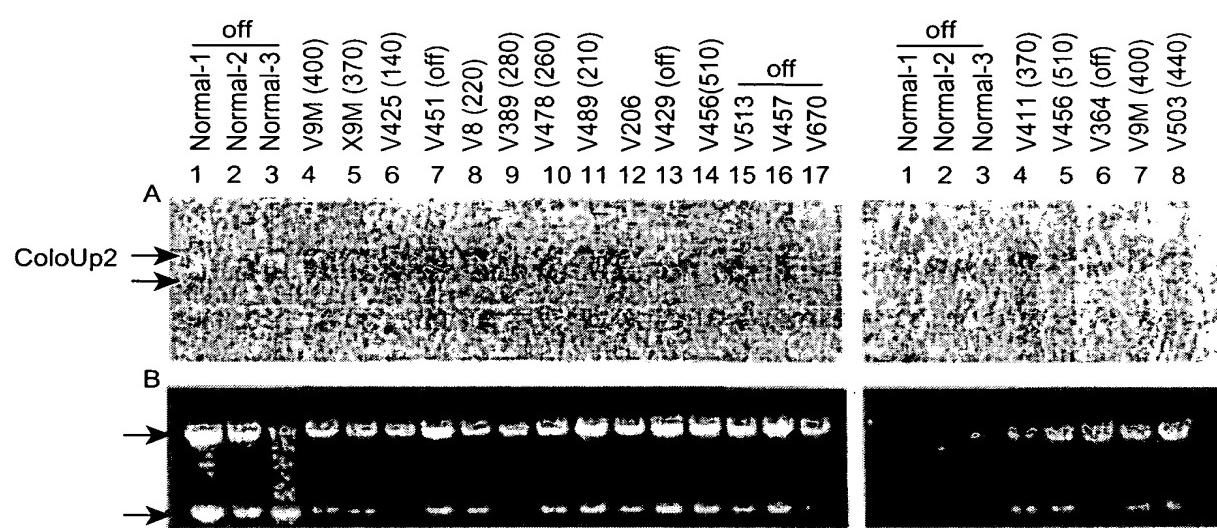


Fig. 31

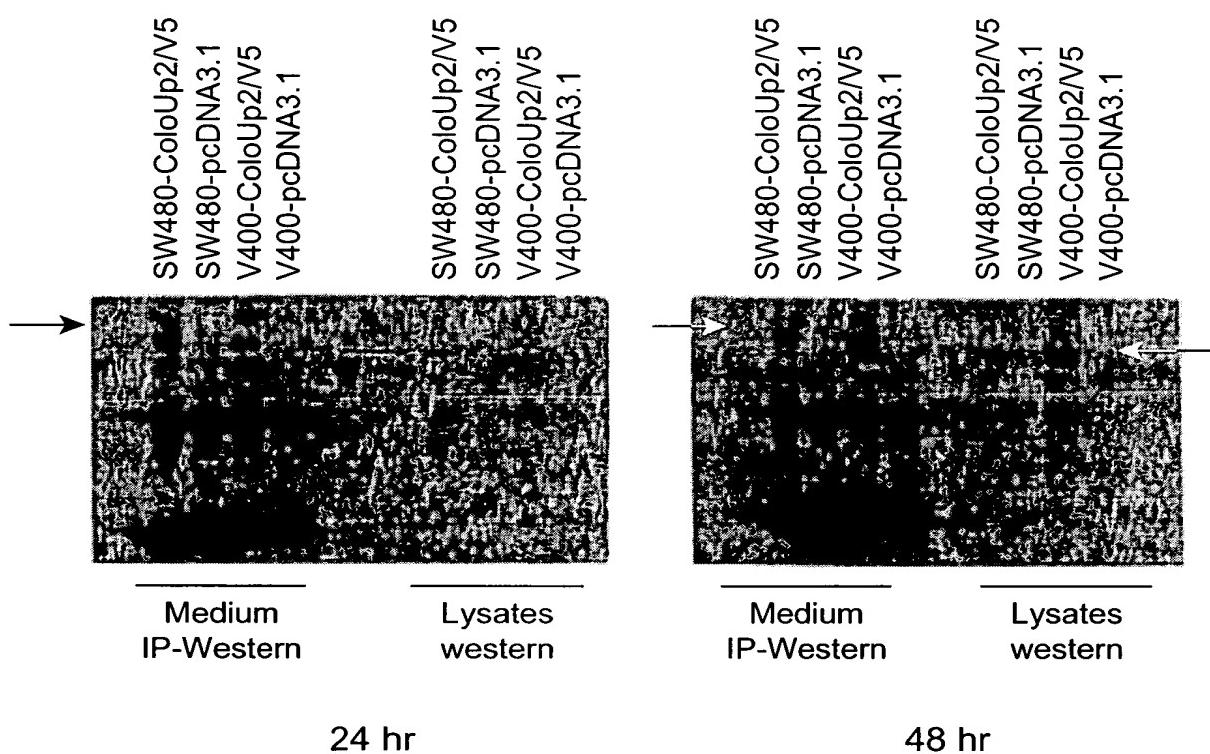


Fig. 32

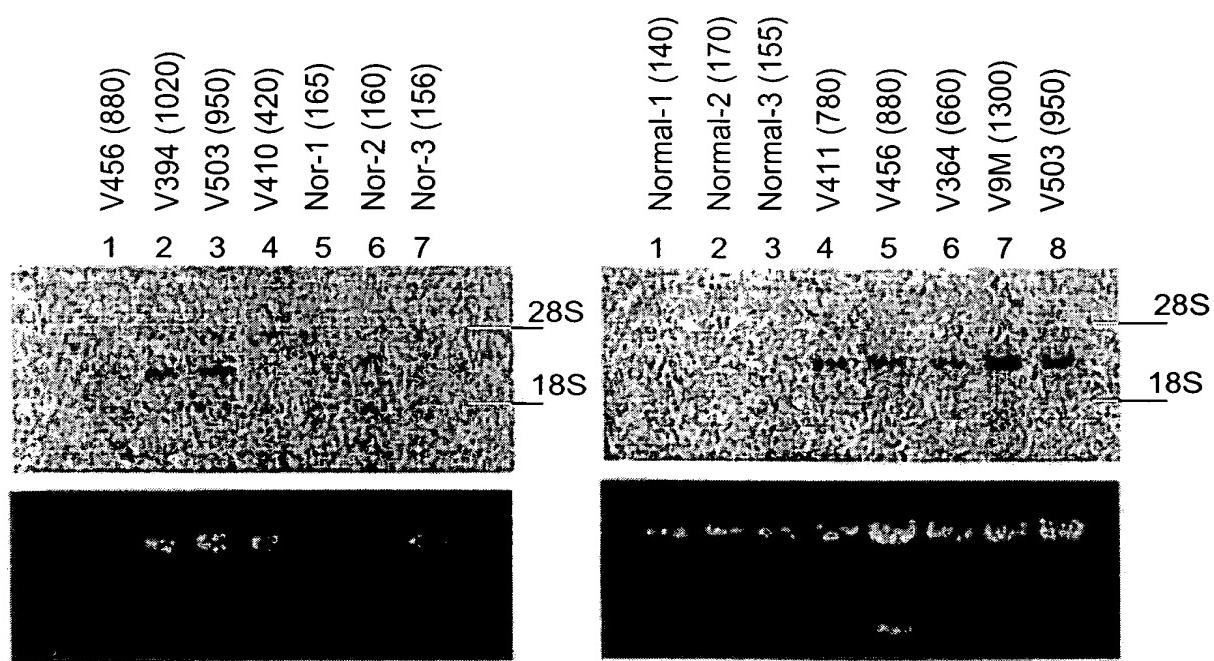


Fig. 33

human foxq1	1	M K L E V F V P R A A H G D K Q G S D L E G A G G S D A P S P L S A A G D D S L G S D G D G A A N S P A A G G G A R D I 60
mouse foxq1	1	M K L E V F V P R A A H G D K M G S D L E G A G S S D A P S P L S A A G D D S L G S D G D G A A N S P A A G S S A G D D L 60
rat foxq1	1	M K L E V F A P R A A H G D K M G S D L E G A G S S D V P S P L S A A G D D S L G S D G D G A A N S P A A G R G A V D L 60
human foxq1	61	Q G D G - E Q S A G G G P G A E E A I P A A A A A V V A E G A E A G A A G P G A G G G A G G G E G A R S K P Y T R R P K 119
mouse foxq1	61	E G G G G E R N S S G G P S A Q D G P - - - - E A T D D S R T Q A S A A G P G A G G G E G A R S K P Y T R R P K 115
rat foxq1	61	E G G G G E R N S S G G A S T Q D D P - - - - E V T D G S R T Q A S P V G P G A G S V G G G E G A R S K P Y T R R P K 115
human foxq1	120	P P Y S Y I A L L A M A I R D S A G G R L T L A E I N E Y L M G K F P F F R G S Y T G W R N S V R H N L S L N D C F V K 179
mouse foxq1	116	P P Y S Y I A L L A M A I R D S A G G R L T L A E I N E Y L M G K F P F F R G S Y T G W R N S V R H N L S L N D C F V K 175
rat foxq1	116	P P Y S Y I A L L A M A I R D S A G G R L T L A E I N E Y L M G K F P F F R G S Y T G W R N S V R H N L S L N D C F V K 175
human foxq1	180	V L R D P S R P W G K D N Y W M L N P N S E Y T F A D G V F R R R K R L S H R A P V P A P G L R P E E A P G L P A A P 239
mouse foxq1	176	V L R D P S R P W G K D N Y W M L N P N S E Y T F A D G V F R R R K R L S H R T T V S A S G L R P E E A P P G P A G T 235
rat foxq1	176	V L R D P S R P W G K D N Y W M L N P N S E Y T F A D G V F R R R K R L S H R T T V S A S G L R P E E A P P G P A G T 235
human foxq1	240	P - P A P A A P A S P R M R S P A R Q E E R A S P A G G K F S S S F A I D S L L R K P F R S R R L R D T A P G T T L Q W G 298
mouse foxq1	236	P Q P A P A A R S S P I A R S P A R Q E E R S S P A S K F S S S F A I D S L L S K P F R S R R D G D D S A L G V Q L P W G 295
rat foxq1	236	P Q P A P A T A G S S P I A R S P A R Q E E G S S P A S K F S S S F A I D S L L S K P F R S R R D G D D P A L G V Q L P W G 295
human foxq1	299	A A P C P P L P A E P A L L P A P C R A L L P L C A Y G A G E P A R T L G A R E A E V P P T A P P L L A P L P A A A P 358
mouse foxq1	296	A A P C P P L R A Y P A L L P A A P G G A L L P L C A Y G A S E P T L L A S R G T E V Q P A A P - L L A P L S T A A P 354
rat foxq1	296	A A P C P P L R A Y P A L L P A S S G A L L P L C A Y G A G E P T L L A S R G A E V Q P A A P - L L A P L S T A A P 354
human foxq1	359	A K P L R G P - A A G G A H L Y C P L R L P A A L Q A A S V R R P G P H L P Y P V E T L L A 403
mouse foxq1	355	A K P F R G P E T A G A A H L Y C P L R L P T A L Q A A A C C G P G P H L S Y P V E T L L A 400
rat foxq1	355	A K P F R G P E T A G A A H L Y C P L R L P T A L Q A A A C C G P G P H L S Y R V E T L L A 400

Fig. 34

Fig. 35

Fig. 35

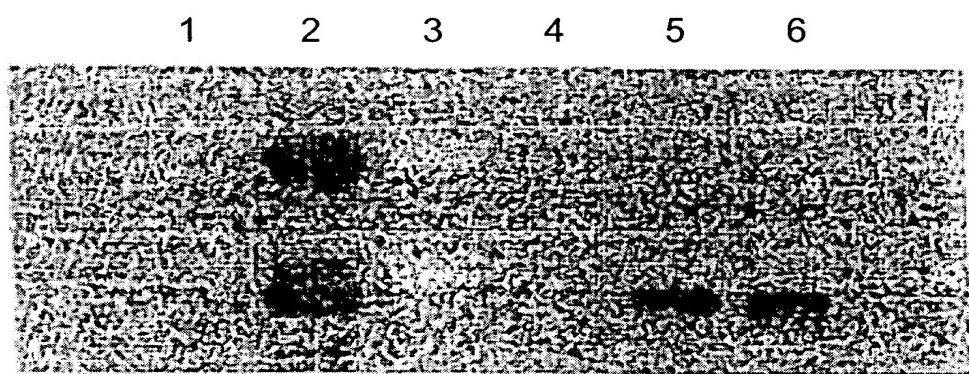


Fig. 36

1 2 3 4 5

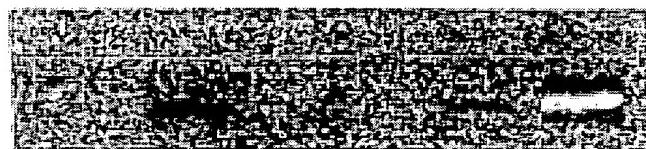


Fig. 37

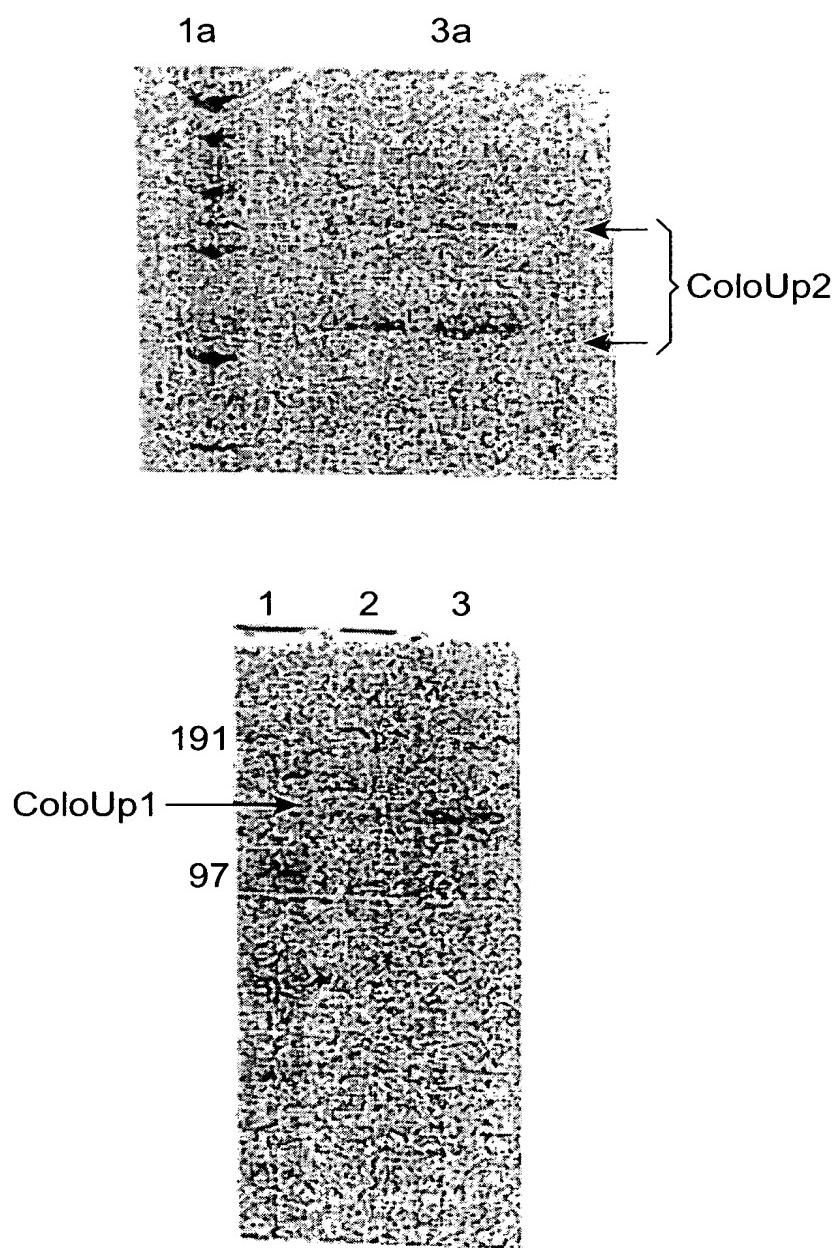
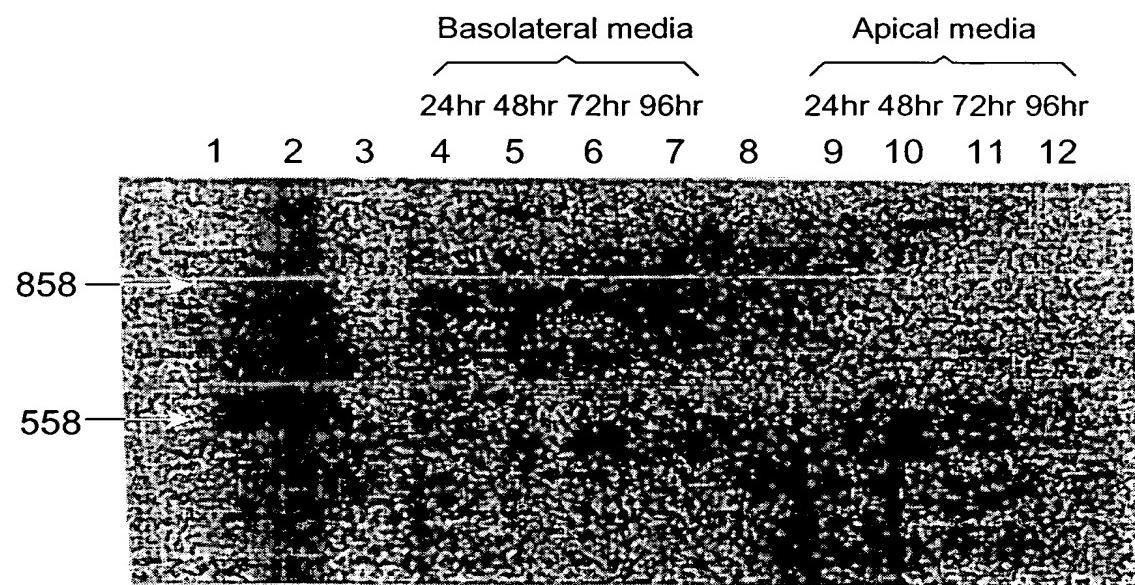
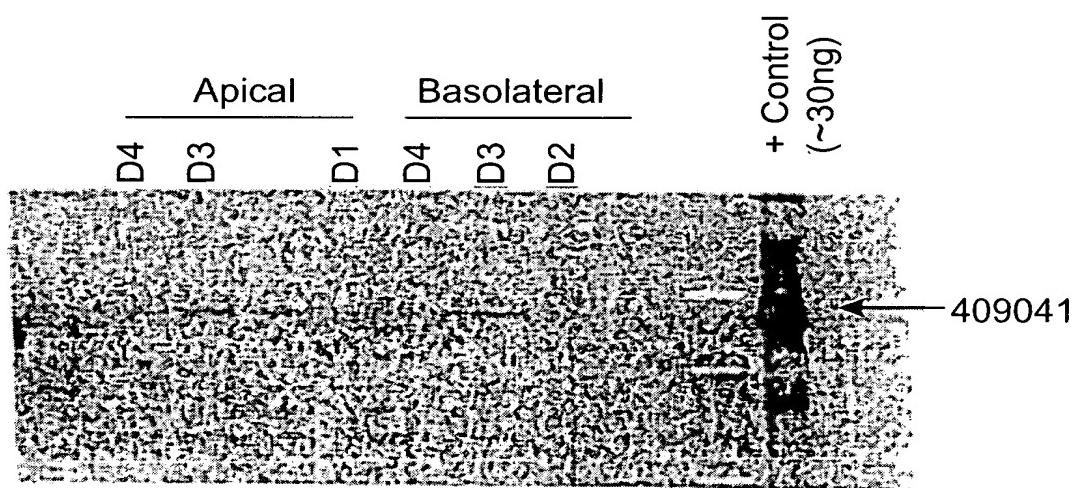


Fig. 38



time points (hr)	resistance	transfection efficiency
0	220	N/A
24	199	15%
48	184	25%
72	220	30%
96	214	30%

Fig. 39



Day	Resistance	% GFP Exp.
0	300	0
1	415	10
2	260	20
3	206	25
4	218	25

Fig. 40

AVLAAHCPFYSWKRVFLTHPATCYRTTCPFPPCDSQPCQNGGTCVPEGLDGYQCL
CPLAFGGEANCALKSLECRVDLLFLLDSSAGTLDGFLRAKVFVRRFVRAVLSE
DSRARVGATYSRELLVAVPVGEYQDVPDLVWSLDGIPFRGGPTLTGSALRQAA
ERGFGSATRTGQDRPRRVVLLTESHSEDEVAGPARHARARELLLLGVGSWAVR
AELEEEITGSPKHVMVYSDPQDLFNQIPELQGKLCSRQPGCRTQALDLVFMLDTS
ASVGPNFAQMGSFVRSCALQFEVVNPDTQVGLVVYGSQVQTFGLDTKPTRA
AMLRAISQAPYLGGVGSAGTALLHIYDKVMTVQRGARPGVPKAVVVLTGGRGA
EDAAVPAQKLRNNNGISVLVVGVGPLSEGLRRLAGPRDSLIIHVAAYADLRYHQD
VLIEWLCGEAKQPVNLCKPSPCMNEGSCVLQNGSYRCKCRDGWEGPHCENRFL
RRP

Fig. 41
Amino Acid Sequence of a Secreted C-terminal Portion of ColoUp2
(SEQ ID NO:21)